

# CRUDE OIL SEVERANCE TAX

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## HEARINGS

BEFORE THE

SUBCOMMITTEE ON ENERGY AND FOUNDATIONS

OF THE

COMMITTEE ON FINANCE

UNITED STATES SENATE

NINETY-SIXTH CONGRESS

FIRST SESSION

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MAY 7, 11, JUNE 11, AND 25, 1979

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Printed for the use of the Committee on Finance



U.S. GOVERNMENT PRINTING OFFICE

WASHINGTON : 1979

46-559

HG 96-32

5361-58

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# CRUDE OIL SEVERANCE TAX

MONDAY, MAY 7, 1979

U.S. SENATE,  
SUBCOMMITTEE ON ENERGY AND FOUNDATIONS,  
COMMITTEE ON FINANCE,  
*Washington, D.C.*

The subcommittee met, pursuant to notice, at 9:40 a.m. in room 2221, Dirksen Senate Office Building, Hon. Mike Gravel (chairman of the subcommittee) presiding.

Present: Senators Gravel, Long, Baucus, Wallop, Dole, Heinz, and Durenberger.

[The press releases announcing these hearings follow:]

[Press Release No. H-22]

*April 11, 1979.*

U.S. SENATE, COMMITTEE ON FINANCE, SUBCOMMITTEE ON ENERGY AND FOUNDATIONS

SUBCOMMITTEE ON ENERGY AND FOUNDATIONS ANNOUNCES HEARINGS ON WINDFALL PROFITS TAXES

Subcommittee Chairman Mike Gravel (D., Alaska) announced today that the Senate Subcommittee on Energy and Foundations will hold hearings on background information on energy and taxation policy. The Subcommittee intends to develop some of the background information that will be necessary when considering tax proposals related to energy production.

The hearings will be held on April 30, and May 7, 1979, in Room 2221, Dirksen Senate Office Building. They will begin at 9:30 a.m.

"The President has proposed decontrol and windfall profits taxes, without spelling out the precise relationship between the two," Senator Gravel said. "In order to make an informed judgment as to the merits of the Administration's proposal, and the alternative proposals which have been and will be put forth by members of Congress, we should begin now to develop the necessary background information. This information should come from the executive department, congressional sources, and outside sources, including investment advisors.

"Much information has been gathered over the past three Congresses, when the Finance Committee has considered various energy tax proposals. This needs to be updated.

"Also, models for analyzing the impact of the current tax proposals need to be readied."

The Administration will testify on the first day, April 30, 1979. Witnesses for the second day, May 7, 1979, will be announced at a later date.

Senator Gravel stated that the Subcommittee would be pleased to receive written testimony from persons or organizations not scheduled to appear at the hearings. Written testimony for inclusion in the record should be typewritten, not more than 25 double-spaced pages in length and mailed with 5 copies by May 21, 1979, to Michael Stern, Staff Director, Committee on Finance, 2227 Dirksen Senate Office Building, Washington, D.C. 20510.

[Press Release No. H-24]

April 27, 1979.

**COMMITTEE ON FINANCE, U.S. SENATE, SUBCOMMITTEE ON ENERGY AND FOUNDATIONS**

**SUBCOMMITTEE ON ENERGY AND FOUNDATIONS POSTPONES HEARING ON WINDFALL PROFITS TAX**

Subcommittee Chairman Mike Gravel (D-Alaska) announced today that the hearing before the Subcommittee on Energy and Foundations on windfall profits taxes that was scheduled for April 30, 1979, will be postponed.

Hearings had been scheduled for April 30 and May 7, 1979. The hearing originally scheduled for April 30 will be held on May 7, and the hearing originally scheduled for May 7 will be held at a later date to be announced.

The hearing now scheduled for May 7, 1979 will begin at 9:30 A.M. in Room 2221 Dirksen Senate Office Building.

[Press Release No. H-25]

May 3, 1979.

**COMMITTEE ON FINANCE, U.S. SENATE, SUBCOMMITTEE ON ENERGY AND FOUNDATIONS**

**SUBCOMMITTEE ON ENERGY AND FOUNDATIONS ANNOUNCES ADDITIONAL HEARINGS ON WINDFALL PROFITS TAXES**

Subcommittee Chairman Mike Gravel (D-Alaska) announced today a second day of hearings on windfall profits taxes will be held on May 11, 1979, and a third day on June 11, 1979.

These hearings will begin at 9:30 A.M. in Room 2221 Dirksen Senate Office Building.

The first day of hearings is scheduled for Monday, May 7, 1979, beginning at 9:30 A.M. in Room 2221 Dirksen Senate Office Building.

Previous announcements with respect to these hearings appear in Press Release H-22 (dated April 11, 1979) and H-24 (dated April 27, 1979).

The witnesses scheduled for the first day, May 7, 1979, are:

The Honorable Emil Sunley, Deputy Assistant Secretary (Tax Analysis), Department of the Treasury;

Richard M. Smith, Director, Office of Policy Coordination, Office of Policy and Evaluation, Department of Energy; and

Dr. Alice Rivlin, Director, Congressional Budget Office.

Senator Gravel stated that the Subcommittee would be pleased to receive written testimony from persons or organizations not scheduled to appear at the hearings. Written testimony for inclusion in the record should be typewritten, not more than 25 double-spaced pages in length and mailed with five (5) copies by June 29, 1979, to Michael Stern, Staff Director, Committee on Finance, Room 2227 Dirksen Senate Office Building, Washington, D.C. 20510.

Senator GRAVEL. We are here today to begin gathering information which will assist Congress in dealing with the oil shortage now facing this country. On April 26, President Carter presented his proposed windfall profits tax and energy security trust fund package intended to direct this through the current energy crisis and to accomplish national energy independence by encouraging greater exploration, research and development of domestic energy resources.

These hearings, the first before the Senate Finance Committee Subcommittee on Energy and Foundations, are intended to assemble background information on the oil and gas production companies which will be necessary to analyze any energy tax proposals such as that proposed by Mr. Carter. Our purpose is to develop as complete a picture as possible of the financial affairs of these companies and the possible impacts of any new energy tax which may be imposed on them. Over the course of these hearings, this information will be provided by representatives of the administration, banking and financing institutions, universities, and industry.

Since the Arab oil embargo, the subject of oil company profitability and the need for increasing domestic oil reserves as well as other energy resources has been often addressed by the Senate. Much information has been obtained over the past three Congresses when the Finance Committee considered the profitability issue and various energy tax proposals.

This information now needs to be updated.

This subcommittee will inquire into the history of oil company profitability over the past decade, including the period of the Arab oil embargo. We also will analyze oil company finances, such as income, cash flow, capital expenditures, dividends, borrowings and equity over this same time period.

Our inquiry will not be left to past financial figures, for it is equally important, in adequately determining the economic effect of the decontrol and taxation program offered by the President, to have reliable estimates of near future profitability and finances.

The impact of such a tax on profitability is but one of the complex issues which must be dealt with before any legislation is enacted by Congress. Just as important to these hearings is the expectation we have that the future spending and investment of profits accruing to these companies will be utilized in domestic oil and gas exploration and production activities.

These are some of the questions which we will seek to answer during these hearings.

We have today the Honorable Emil Sunley, Deputy Assistant Secretary, Department of the Treasury with respect to Tax Analysis. Next, we will have Mr. Richard Smith, Director of the Office of Policy Coordination, Department of Energy, who I will ask to join the panel. Then Alice Rivlin, Director of the Congressional Budget Office will follow, to join the last two in a panel.

I would like to have all three, after they have made their presentations, sit here as a panel so that we can have a colloquy between the members of the committee and the witnesses. We will withhold our questions until we have had a presentation of all three witnesses.

I would like to recognize for an opening statement, my colleague Senator Wallop.

Senator WALLOP. Mr. Chairman, I have an opening statement that I would like to submit for the record. I agree with you that we want to look at this whole situation with some detachment and not fall prey to what has been the habit of most people on the outside in talking about this tax, that is, flaming rhetoric about oil company profits, and other things. It seems to me that it is time to be responsible, and basically that is the gist of the statement that I will insert in the record, along with some information about oil company profits in the last decade.

[The prepared statement of Senator Wallop and attachments follow:]

#### PREPARED STATEMENT OF SENATOR MALCOLM WALLOP

Thank you Senator Gravel for your introduction and for holding these hearings on the proposed decontrol tax.

I am pleased that the Subcommittee on Energy and Foundations is taking the time to investigate the facts regarding the President's tax proposals, and the effects of decontrol. It is regrettable that the outset of the debate on a decontrol profits tax has been clouded in rhetoric and confusion over the level of energy

industry profits. The presumption established is that energy companies have already been reaping huge, disproportionate profits. This simply is not the case.

I think some clarity can be lent to the issue by quoting a noted energy expert who was asked whether oil company profits are reasonable. His response was, "At the present time they certainly are reasonable. The profits have not increased in the industry since 1974 and in real terms they have declined. The oil companies are not doing spectacularly well in comparison to other manufacturing industries. The question is prospective profits, the effect of decontrol, the effects of OPEC prices. But it is I think a misconception that at this point oil company profits are spectacularly high."

The author of the quote is an energy expert with whom I often disagree, but in this instance Secretary Schlesinger is right. Oil company profits have not been excessive.

A recent Citibank study indicates that in the decade 1968 to 1977, the rate of return for petroleum companies was 13.9 percent compared to 13.3 percent for all manufacturing. In five of those ten years, the petroleum industry's rate of return was below average. Preliminary 1978 data at Citibank shows a 14.3-percent rate of return for oil companies compared to 16 percent for all manufacturing.

To illustrate my point further, I would like to include for the record a few charts which demonstrates the level of oil company profits compared to other major industries.

And what about those high profits reported for the first quarter of this year? It is important to keep in mind that companies have been delivering unprecedented amounts of oil to the American people. Consumption levels for January and February were at all time record highs. Our inventories are greatly depleted and oil companies will have to rebuild the inventories with higher priced oil.

If we look at the first quarter profits of other companies, it is evident that profits are up in many industries. American Motors profits in the first quarter of 1979 increased 1,100 percent over the same period last year. National Steel was up 763 percent, Alcoa up 137 percent and B. F. Goodrich was up 68 percent over the first quarter of last year. Are we to put the word out that profits in a free enterprise economy are to be discouraged?

Congress may decide to adopt a tax on profits resulting from decontrol, but I trust we can begin the debate with correct information, and consider a decontrol profits tax by reviewing the true situation, rather than acting on rhetoric and innuendo.

The other side of energy taxes we can examine in these hearings is whether industry can meet the staggering capital requirements needed to develop new energy resources, and convert existing resources into clean efficient fuels. My preference is to make sure that the energy industry has adequate capital to invest in energy exploration and production.

Studies by the Department of Energy, Chase Manhattan Bank and the Bankers Trust Company indicate that U.S. energy companies will need \$20 to \$26 billion annually through the mid-1980's just to maintain current reserve levels. The two bank studies show that the petroleum industry's total capital expenditures in the U.S. through the mid-1980's should average around \$40 billion a year.

In contrast, total oil company capital expenditures for the decade 1967 to 1976 average about \$11.6 billion. Of that total, about \$7.5 billion was for exploration and development. Clearly the financial means must be made available if the U.S. is to meet the energy investment requirements that will hold our reserves constant, let alone reduce our dependence on foreign energy sources.

The President was proud to announce that his proposed windfall profits tax would limit the oil companies' increased income to \$6 billion over the next three years. His tax proposal with its absence of a credit to encourage production and exploration, fails to recognize the capital demands of the energy industry.

Rather than viewing oil decontrol as an opportunity to levy a new tax, create new programs and spend more money, decontrol could allow us to channel more private investments into the production of energy.

We all welcome the administration witnesses and the opportunity to review the proposed decontrol tax. I am troubled by the complexities of the President's program, and the indication that even more complex proposals are being considered in the House. Complexities in the energy tax laws will bother the major oil companies, who have plenty of lawyers and accountants to handle new problems less than some, but more complexities in the tax laws will detract time and resources from the small independent drillers who account for over 90 percent of the new wells drilled in the U.S. These are the people who are taking the risks to find new oil in Wyoming and other western states, and they should have tax laws that support them in this effort.

## PERCENTAGE RETURN ON AVERAGE SHAREHOLDERS' EQUITY

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1968-77 (average)
Gulf.....	13	11	11	9	15	19	11	12	10	11	12.5
Exxon.....	12	12	14	13	19	20	15	15	13	14	.....
Mobil.....	11	11	12	12	16	17	12	13	13	13	.....
Texaco.....	13	13	14	13	18	19	10	10	10	10	.....
Socal.....	11	11	12	12	17	17	12	13	14	14	.....
Amoco.....	10	10	10	10	13	21	15	15	16	.....	.....
All oil companies.....	11	11	10	10	15	19	13	14	14	.....	13.2
Leisure time industries.....	7	6	9	12	18	16	14	15	16	.....	16.0
Automotive companies.....	13	7	13	15	16	7	7	17	18	.....	13.0
Radio and TV.....	12	12	12	15	11	12	12	19	20	.....	14.7
Publishing.....	13	12	12	13	15	12	11	13	17	.....	14.7
Drugs.....	19	19	18	19	20	19	19	18	16	.....	13.6
Steel.....	8	5	5	6	9	16	10	8	0	.....	13.9
Miscellaneous manufacturing.....	11	8	10	10	12	14	12	14	13	.....	9.8
											12.0

## PERCENTAGE RETURN ON AVERAGE CAPITAL EMPLOYED

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1968-77 (average)
Gulf.....	10	9	8	7	12	15	10	10	9	9	10
Exxon.....	10	10	11	11	15	16	13	12	10	11	.....
Mobil.....	9	9	10	10	13	14	10	10	10	10	.....
Texaco.....	10	11	11	10	14	15	8	8	8	8	.....
Socal.....	9	9	9	9	11	14	10	10	9	11	.....
Amoco.....	8	8	8	8	10	16	11	12	10	.....	.....
Major oil companies.....	10	9	8	7	12	15	10	10	9	.....	10
All petroleum.....	9	9	9	8	12	15	10	9	10	.....	9
Publishing.....	10	9	9	10	11	10	9	11	10	.....	10
Radio and TV.....	7	7	7	10	8	9	9	13	14	.....	10
Personal care.....	15	15	15	16	16	14	13	14	14	.....	15
Savings and loan.....	12	11	16	13	13	13	12	14	16	.....	13
Steel.....	6	4	4	5	7	12	8	6	1	.....	6

## Top 10 industries in return on capital employed

[In all cases, based on survey of 41 industries]

1968-77 averages			1973-77 averages		
Rank:	Percent return	Rank:	Percent return	Rank:	Percent return
1. Drugs.....	16.1	1. Drugs.....	15.9	1. Drugs.....	15.9
2. Instruments.....	14.5	2. Oil services.....	15.2	2. Oil services.....	15.2
Personal care.....	14.5	3. Office equipment.....	14.4	3. Office equipment.....	14.4
4. Oil services.....	13.9	4. Instruments.....	14.3	4. Instruments.....	14.3
5. Office equipment.....	13.8	5. Personal care.....	14.1	5. Personal care.....	14.1
6. Tobacco.....	12.4	6. Coal.....	13.9	6. Coal.....	13.9
7. Beverages.....	11.6	7. Special machinery.....	12.7	7. Special machinery.....	12.7
8. Coal.....	11.4	8. Tobacco.....	12.5	8. Tobacco.....	12.5
Special machinery.....	11.4	9. Electrical products.....	11.8	9. Electrical products.....	11.8
10. Electrical products.....	11.2	10. Beverages.....	11.7	10. Beverages.....	11.7
16. Petroleum.....	10.3	12. Petroleum.....	11.3	12. Petroleum.....	11.3

## Top 10 Industries in Return on Shareholders' Equity

1968-77 averages			1973-77 averages		
Rank:	Percent return	Rank:	Percent return	Rank:	Percent return
1. Drugs.....	18.7	1. Coal.....	20.4	1. Coal.....	20.4
2. Oil services.....	18.0	2. Oil services.....	19.8	2. Oil services.....	19.8
3. Personal care.....	17.3	3. Drugs.....	18.7	3. Drugs.....	18.7
4. Coal.....	16.9	4. Personal care.....	17.0	4. Personal care.....	17.0
5. Office equipment.....	16.3	5. Office equipment.....	16.8	5. Office equipment.....	16.8
6. Tobacco.....	16.2	6. Tobacco.....	16.7	6. Tobacco.....	16.7
7. Instruments.....	15.8	7. Instruments.....	15.7	7. Instruments.....	15.7
8. Trucking.....	15.2	8. Special machinery.....	15.6	8. Special machinery.....	15.6
9. Radio-TV broadcasting.....	14.7	9. Radio-TV broadcasting.....	15.4	9. Radio-TV broadcasting.....	15.4
10. Beverages.....	14.5	10. Chemicals.....	15.0	10. Chemicals.....	15.0
17. Petroleum.....	13.2	Trucking.....	15.0	Trucking.....	15.0
		12. Petroleum.....	14.9	12. Petroleum.....	14.9

Senator GRAVEL. Thank you.

Would any other member like to make a comment at this time?

Senator Dole.

Senator DOLE. I appreciate the Chairman, Senator Gravel, calling these hearings. There is going to be considerable discussion, on ways to produce energy and ways to manipulate taxes.

The Country has been waiting for 2½ years for an energy message from the President of the United States. Since 1977, our energy supply position has deteriorated. We have not lessened our dependence on imported fuel. In fact, our dependence has been increased. Congress spent most of the time the past 2 years addressing a tax bill, not an energy program.

The initiation of the decontrol of domestic oil is some positive steps toward stopping the subsidization of imported crude oil. I advocated the replacement prices for newly discovered oil for many years. However what we have, in effect, proposed by the administration, is not a "windfall profits tax but an excise tax on oil—a warmed-over version of the so-called crude oil equalization tax that Congress, particularly the Senate, soundly rejected last year. The excise tax has the same deficiencies as COET.

If, there is a windfall, then I think we have an obligation to either impose a tax or to encourage the industry to return that revenue back into more exploration and development.

What we truly need in this country, is increased energy supplies. We should not reject out of hand an energy surtax to be imposed if the decontrol revenue is spent for increased oil exploration. If we are going to ask the American people to sacrifice because of higher prices, they should have some assurance the industry is seriously looking for more energy supplies.

I would ask that my statement be made a part of the record. I would say that a true windfall profits tax is the proper approach. I expect to introduce such a proposal in the near future.

[The prepared statement of Senator Dole follows:]

#### PREPARED STATEMENT OF SENATOR BOB DOLE

Mr. Chairman, it has been over two years since the administration declared the "moral equivalent of war" on our energy problems. However, since that time, our energy supply situation has deteriorated: We have not lessened our dependence on imported fuel. Instead, Congress spent the first two years of the current administration considering a tax bill, not energy legislation. Ultimately, Congress rejected most of the ill-conceived taxes, including the centerpiece—the crude oil equalization tax.

The Administration, in initiating decontrol of domestic oil has, at least, taken some positive steps toward ending the subsidization of foreign crude oil. I have advocated replacement prices for "newly discovered" oil for many years.

The Administration has suggested a tax on the new revenues generated by oil decontrol. The tax has been labeled a windfall profits tax. Windfall profits tax is a misnomer. There is no tax on profits. The proposal is nothing more than an excise tax on crude oil. It is a warmed over version of COET. Therefore, it suffers from the same deficiencies. Little in the President's new energy plan, other than world prices for newly discovered oil, provides incentives for domestic exploration.

I am concerned that oil companies will receive billions of dollars in increased revenues and can use that money for whatever purpose they desire. I don't believe we should reject out of hand an energy surtax to be imposed unless decontrol revenue is spent for increased oil exploration. If the American people are being asked to sacrifice because of higher prices, they should have some assurances that more energy will be available.



A true "windfall profits" tax is the proper approach. I expect to introduce such a proposal in the near future.

I look forward to hearing the comments of the witnesses today.

Senator GRAVEL. Senator Heinz.

Senator HEINZ. I have no statement, thank you.

Senator GRAVEL. Very good. Mr. Sunley.

**STATEMENT OF HON. EMIL SUNLEY, DEPUTY ASSISTANT  
SECRETARY OF THE TREASURY FOR TAX ANALYSIS**

Mr. SUNLEY. Mr. Chairman and members of this subcommittee, I am pleased to appear today to discuss in some detail what we know about oil company profitability and financing. Without going into the specifics of the President's energy program, I will describe our estimates of the impact of this program on oil company profitability. Hopefully, the testimony will provide useful background information for the committee's consideration of the President's proposals, particularly his windfall profits tax.

The President on April 5 announced that he is phasing out Government price controls that hold down our domestic production, encourage consumption, and increase our dependence on foreign oil. However, as controls end, oil companies will reap billions of dollars of windfall profits. The President therefore, has proposed a tax to capture these windfall profits. This tax will provide needed revenue to help those most hurt by decontrol, to improve mass transit, and to fund energy research and development.

I have included in the appendix several tables containing basic data on the petroleum industry—its size, structure, taxes, profitability, assets and liabilities, and sources and uses of funds. In my testimony I want to highlight the salient facts and conclusions to be drawn from those tables. As I proceed, I will make note of the limitations of the data.

In the course of previous reviews of oil industry economic statistics, I am sure you have learned there is no single completely satisfactory set of statistics by which to accurately characterize this industry. There are three basic confounding factors that create this state of affairs: vertical integration, conglomeration, and foreign operations. First, although the oil and gas industry is fundamentally a collection of extractive activities, minerals must first be processed and transported before they may be used. As a result, the structure of enterprises engaged in the mineral business, including oil and gas companies, is extremely heterogeneous. At one extreme, there are some few companies wholly devoted to oil and gas extraction; but even these companies may engage in exploration and development to maintain their productive capacity. At the other extreme, there are companies which participate to a greater or lesser degree in all stages of the oil and gas business, from exploration through refining to retail distribution of petroleum products. Obviously, changes in wellhead oil and gas prices have more economic impact on the exploration through production stages of the business than on transportation, processing, and distribution. Unfortunately, none of the standard statistical series relating to the operations of enterprises popularly called oil companies makes distinctions between the several stages of the oil business.

Second, the mineral and fuel market expertise of oil company managements, particularly their skill in, and aptitude for, long-range investment planning, is, and has been, transferable to nonoil and gas activities. Oil companies not only engage in the closely related activities of the petrochemical industry, some also engage in coal and metal mining. Company statistics are not readily decomposed into the different lines of activity in which they engage, and this makes still more difficult the task of assessing effects of oil price policy on the economic position of oil companies.

Third, virtually every company with significant U.S. oil production is also active abroad. Normally, available company financial data do not provide a basis for clearly distinguishing domestic from foreign operations, and in those cases, such as tax returns and FTC financial surveys, where a consistently defined domestic/foreign reporting system is imposed, the classification of financial data by line of activity is still beyond reach. Moreover, since 1971, and particularly since 1973, sharp changes in the foreign exchange value of the dollar have resulted in equally sharp but opposite changes in the dollar value of foreign earnings. This adds another dimension of interpretative difficulty to the evaluation of oil company financial statements.

I will now review some basic information relating to the petroleum industry—its size, market structure, and financial accounts—and will then turn to issues of the profitability of the industry and its investment behavior.

#### INDUSTRY PERSPECTIVES

The Department of Commerce publishes estimates of the volume of economic activity occurring within the political boundaries of the United States. The aggregate measure, called gross domestic product (GDP), is the value of goods and services produced for domestic use and export, and this is further broken down into the several sectors, manufacturing, agriculture, et cetera. In 1978, petroleum extraction and refining accounted for 2.6 percent of GDP, measured in 1978 dollars; in 1971, the petroleum sector accounted for 1.7 percent of GDP, measured in 1971 dollars. This would appear to indicate an increase in the relative importance of petroleum sector activity. However, when GDP and the portion originating in the petroleum sector are expressed in constant (1972) dollars, using the specific deflators for each sector, the petroleum sector share has actually declined, a reflection of the decline in domestic oil production since 1970-72.

Sector	1971	1972	1973	1974	1975	1976	1977	1978
PERCENT OF GROSS DOMESTIC PRODUCT								
Current dollars:								
Petroleum.....	1.7	1.7	1.8	2.2	2.2	2.5	2.6	2.6
Other manufacturing.....	23.0	23.1	23.1	21.7	20.9	21.4	21.6	97.4
All other.....	75.3	75.2	75.2	76.1	76.9	76.1	75.8	
1972 dollars:								
Petroleum.....	1.8	1.7	1.6	1.6	1.7	1.6	1.6	1.6
Other manufacturing.....	22.2	23.1	23.9	22.5	21.5	22.4	22.7	98.4
All other.....	76.0	75.2	74.5	75.9	76.9	76.0	75.7	

Source: Appendix tables I-A, I-B, I-C.

Even the large increase in current dollar product originating in the petroleum sector in 1974 (when the OPEC quadrupling of world oil prices spilled over into that portion of the U.S. oil output then uncontrolled) barely offset the production decline. As critical as the oil industry is, it is helpful to bear in mind that it accounts for less than 2 percent of domestic economic activity, less than one-tenth of manufacturing.

Although there are at least 65,000 unincorporated enterprises and about 10,000 corporations directly engaged in the petroleum sector of the economy, a relatively few entities, perhaps 25 to 30, account for a major fraction of petroleum produced or processed. In large part, this is an outcome of the geological characteristics of underground reserves. Most of our domestic oil production is provided by giant fields previously discovered, and major interests in these prolific discoveries remain in the hands of the original discoverers. Finders of giant fields become giant companies, often integrating forward into refining and marketing, although companies originally large refiners and marketers have also successfully integrated backward into discovery and production.

In further part, this reflects specialization in the discovery process. Some enterprises prefer to apply their skills and taste for the assumption of risk primarily to the finding of oil which, for reasonable compensation, they sell to, or share with, integrated companies that can assure a market for the oil. Thus, in 1975, tax return data reporting worldwide sales of integrated petroleum and refining companies show that over 96 percent of the sales were accounted for by 28 companies, 1.7 percent of the total. This dominance of the largest firms is also reflected in FTC data pertaining only to domestic sales: nearly 93 percent of total sales was reported by the largest firms, those with assets over \$250 million.

Similarly, because capital intensity in the oil business is extremely high, corporations are by far the most dominant form of business organization. In 1976, the most recent tax year available, among enterprises engaged in oil and gas extraction and refining corporations accounted for over 98 percent of sales, but only 13 percent of the enterprises in the industry.

#### INTEGRATED PETROLEUM AND REFINING COMPANIES: 1975

[Dollar amounts in millions]

Asset size	Companies		Sales	
	Numbers	Percent	Amount	Percent
From tax data: (worldwide)				
All sizes	1,622	100.0	\$259,479	100.0
Under \$10,000,000	1,531	94.4	1,628	0.6
\$10,000,000 under \$50,000,000	36	2.2	1,609	0.6
\$50,000,000 under \$250,000,000	27	1.7	7,010	2.7
\$250,000,000 or more	28	1.7	249,232	96.1
From FTC data: (domestic)				
All sizes	(1)	(1)	121,757	100.0
Under \$10,000,000	(1)	(1)	1,172	1.0
\$10,000,000 under \$50,000,000	(1)	(1)	1,744	1.4
\$50,000,000 under \$250,000,000	(1)	(1)	5,886	4.8
\$250,000,000 or more	(1)	(1)	112,955	92.8

<sup>1</sup> Not available.

Source: Appendix table II.

## U.S. OIL EXTRACTION AND REFINING ENTERPRISES

[Dollar amounts in millions]

	1973	1974	1975	1976
Worldwide sales .....	\$141,696	\$309,263	\$308,558	\$361,351
Percentage by:				
Corporations .....	98.1	98.5	98.2	98.2
Proprietorships .....	1.1	.8	.9	.9
Partnerships .....	.8	.7	.9	1.0

Source: Appendix table III.

Due to the historical precedence of the U.S. oil industry, it has been a dominant force in world trade. When rich oil discoveries abroad burgeoned during the preceding 35 years, U.S. companies were among the most successful developers of productive capacity. As a consequence, the income of U.S. oil companies is predominantly foreign. In 1976, nearly 80 percent of all oil company corporate income subject to tax derived from foreign operations. However, there is some indication that the widespread resource to expropriation policies abroad has caused some decline in the relative importance of foreign operations of U.S. companies.

## FOREIGN AND DOMESTIC TAXABLE INCOME; ALL OIL COMPANY TAX RETURNS

[Dollar amounts in millions]

	1972		1975		1976	
	Amount	Percent	Amount	Percent	Amount	Percent
Worldwide taxable income .....	\$7,781	100.0	\$38,146	100.0	\$46,643	100.0
Foreign operations .....	6,760	86.9	31,791	83.3	36,450	78.2
Domestic operations .....	1,021	13.1	6,355	16.7	10,193	21.9

Source: Appendix table IV.

As a final perspective on the oil industry, I would like to review its financial structure. For this purpose, I shall utilize data from the Compustat file of financial reports maintained by Standard and Poor's and also financial survey data published by the Federal Trade Commission. The Compustat file covers more than 3,000 publicly held corporations, and records data from their financial statements. The FTC survey directly collects financial information from a sample of nonfinancial corporations; in contrast with Compustat and other compilations of financial statistics, the FTC data are requested in a format designed to isolate foreign operations. With respect to the oil companies each includes in its coverage, the balance sheet and income statement items are not fully comparable with those reported by other manufacturing corporations. The asset and income accounting conventions used by oil companies more frequently permit current deduction of investment outlays for establishing the existence of oil and gas reserves, a significant and valuable asset. This results in a relative understatement of income whenever such outlays are increasing and in an undervaluation of the reserves and net worth. However, these accounting conventions are less frequently used by smaller independent companies engaged primarily in extraction.

In 1977 the Compustat data indicate that oil extraction companies had 75 percent of their total assets in fixed plant, integrated and refining companies 65 percent, and nonoil companies only 43 percent.

This mildly understates the heavy reliance of oil companies on fixed plant. Other companies devote more of their assets to working capital—cash and inventories—and this provides them a higher average turnover rate. Because the FTC data are especially consolidated to focus on domestic operations, the balance sheet elements based on reports to the FTC (app. table V) do not usefully portray the composition of assets employed: the value of plant, equipment, and working capital in foreign operations is subsumed under "other assets" in the form of interests in those enterprises.

FIXED ASSETS AS PERCENTAGE OF TOTAL ASSETS

Industry	1971	1972	1973	1974	1975	1976	1977
Oil and gas extraction.....	69	69	69	70	71	72	75
Integrated petroleum and refining.....	70	70	66	61	62	63	65
All other manufacturing.....	45	44	43	43	44	43	43

Source: Appendix table VI.

Notwithstanding the oil companies' greater reliance on fixed assets, the method by which they finance their total assets does not markedly differ from other large companies. For example, in 1977 oil extraction and integrated refining companies financed 63 and 61 percent of their assets by equity, respectively, as compared with 66 percent for other manufacturing corporations. Although the equity percentage of other manufacturing has held fairly steady over the period 1971-77, the equity percentage of oil companies appears to decline, suggesting a greater reliance on debt.

Both the slightly lower oil company equity percentages and the indicated declines therein are influenced by the accounting conventions noted above. In the period since 1972, when oil prices have been rising, many of the oil companies' real assets have been appreciating. Thus, as large volumes of resource replacement expenditure have been made, more of these additions to total assets have been financable by borrowing on the enhanced, but financially unrecorded, value of oil company reserves.

These comparative statistics are consistent with the FTC data, after allowance for the differences in definition of total assets. Whereas we have "netted out" trade credit in compiling Compustat data, the FTC data include the total of accounts and short-term notes receivable among the assets, and total accounts and short-term notes payable among the liabilities. As compared with the foregoing Compustat percentages, both the oil companies' and others' figures are lower, the latter by more because of the greater importance of trade credit in their operations but the downward trend of the oil companies' equity percentage still appears while the other companies' percentages hold steady.

EQUITY (NET WORTH) AS PERCENTAGE OF TOTAL ASSETS

Industry	1971	1972	1973	1974	1975	1976	1977
Oil and gas extraction.....	69	66	67	65	64	63	63
Integrated petroleum and refining.....	71	71	71	67	64	61	61
All other manufacturing.....	67	68	67	64	65	66	66

Source: Appendix table VI.

## EQUITY (NET WORTH) AS PERCENTAGE OF TOTAL ASSETS

Industry	1974	1975	1976	1977	1978
Integrated petroleum and refining.....	63	62	60	59	57
Other manufacturing.....	51	52	53	52	51

Source: Appendix tables V-A and V-B.

A final descriptor of the financial structure of corporations is the ratio of long-term debt to equity. Given the near equivalence of oil and nonoil company equity percentages and the fact that nonoil companies rely more on trade credit, it follows that oil companies will exhibit slightly higher long-term debt to equity ratios. Thus, in 1977 when oil extraction and integrated refining companies had long-term debt outstanding equal to 36 and 35 percent of their equity, respectively, other manufacturing firms had a ratio of but 30 percent.

## LONG-TERM DEBT AS PERCENTAGE OF EQUITY

Industry	1971	1972	1973	1974	1975	1976	1977
Oil and gas extraction.....	35	39	36	35	35	38	36
Integrated petroleum and refining.....	28	28	26	25	31	34	35
Other manufacturing.....	33	32	31	34	34	31	30

Source: Appendix table VI.

## PROFITABILITY

I should like to make four general observations before reviewing the information on oil company profitability we have been able to assemble.

First, profits have a complex relationship to changes in the price of output. When output prices, crude oil prices in the present instance, rise, profits also immediately rise. However, the extent to which higher profits can be maintained depends upon the behavior of costs. Real unit costs rise as greater effort is expended on pumping oil from existing fields and as less attractive prospects are drilled. Until costs rise to fully match increases in output prices and thus to restore profits to normal levels, higher levels of profits will prevail.

Second, profits are an aggregate, like a wages bill or costs of materials. For an enterprise as for a collection of them, as activity expands and efforts are made to increase capacity, the capital aggregate to which the profits are attributable also grows. It is one thing to observe that a wages bill has doubled while the number of person-hours expended has remained the same; it is another to observe that wages have doubled simply because twice as many person-hours are employed. Similarly, profits may be evaluated only if they are compared to an appropriate base. Profit per dollar of equity capital is one such measure.

Third, profits are but one share of the income generated by the capital employed by an enterprise. As we have noted, about a third of oil company assets are financed by creditors. If we are to examine the vitality of an industry, we must consider the net return earned by all the assets, the sum of interest to creditors and profits to shareholders.

Finally, prices and sales revenues are all pretax magnitudes. But it is commonly accepted that individuals making market decisions are driven by after-tax magnitudes. Consumers may spend only what remains to them from their earnings after tax; and the funds to acquire capital assets are also what creditors and shareholders have left from their earnings from all sources after tax. At the corporate level, then, what is of interest in discussing profitability is what remains from the corporation's product after all costs and corporation taxes, when this residual magnitude is expressed as a rate of return to equity or to total assets employed.

"Profits" of corporations are a residual obtained by subtracting from the amount of receipts (sales plus returns on securities held) the cost of goods sold, interest paid creditors, and an allowance for capital consumption. Thus, there is no unambiguous measure of "profit." While receipts are measurable with little controversy, measurement of the cost of goods sold in a period of inflation is both difficult and controversial, and for oil companies, whether certain outlays for reserve discovery and development should be treated as current period costs of goods sold or capitalized is a further controversial and unresolved issue, as is then the allowance for capital consumption.

To illustrate the great variance in measures of oil company profits, in 1976, the taxable income of oil companies was \$46.6 billion; for that same year, the Department of Commerce estimated pretax corporate profits for the same companies at \$13.5 billion. By far the biggest source of difference between these two measures is due to scope: Taxable income is worldwide, national income and products account profits by industry are restricted to domestic production. The other large source of difference arises from differences between tax rules for treating outlays for depreciable and depletable property and for income excluded by the code, such as tax-exempt interest and percentage depletion. Thus, over the period from 1971 to 1976, income (profits) subject to tax increased by a factor of 7, national income profits by a factor slightly greater than 3.

PRETAX PROFITS OF U.S. OIL COMPANIES  
(In billions of dollars)

	1971	1972	1973	1974	1975	1976
Worldwide income subject to tax.....	6.7	7.8	13.5	37.9	38.1	46.6
Corporation profits, domestic, national income and product accounts basis.....	4.0	3.9	6.0	12.1	10.1	13.5

Source: Appendix tables VII-A, VII-B.

If one accepts the National Income Accounts estimate of oil company profits, then these may be compared with the estimate of associated Federal income tax from the same source. In 1976, after payment of State and local income taxes, \$12.8 billion of oil company domestic income generated \$3.8 billion in Federal tax liability, an average tax rate of 29.9 percent. It will be observed that in 1975 and 1976, the average rate of tax estimated by the Commerce Department has increased, from 21.7 percent in 1974 to 26.6 percent in 1975. This reflects, of course, the repeal of percentage depletion for oil and gas with respect to the integrated oil companies.

## CORPORATIONS IN THE PETROLEUM SECTOR

[Dollar amounts in billions]

	1971	1972	1973	1974	1975	1976
Corporate profits before Federal income tax, <sup>1</sup> national income and products account basis.....	\$3.9	\$3.8	\$5.8	\$11.7	\$9.6	\$12.8
Federal income tax liability.....	.7	.8	1.3	2.5	2.6	3.8
Average tax rate on national income and products account profit (percent).....	19.0	20.4	22.2	2.17	26.6	29.9

<sup>1</sup> Corporate profits after State and local income taxes.

Source: Appendix table VIII.

Unfortunately, the National Income and Products Accounts estimates of oil company profits and Federal income taxes cannot be used to derive a useful measure of profitability. There is no corresponding balance sheet to provide a measure of the capital employed in the industry nor to indicate how the claims against this capital are distributed as between creditors and shareholders. For measures of the profit rate, then, we must turn to financial statements, keeping in mind the inherent weaknesses of the measures of pretax income and the balance sheet valuation of assets and net worth.

The indications here are that in 1977, while all nonoil companies in the Compustat file earned an after-tax rate of return of 14.8 percent, oil extraction companies earned slightly less, 14.7 percent, and integrated oil and refining companies still less, 13.5 percent. During the period 1971-77, while nonoil companies were increasing their rates of return by 3.5 percentage points, or 31 percent, extraction companies increased their extremely low 1971 rate of return by 119 percent, and integrated companies increased their return by 25 percent. In 1974, as a result of the higher prices on crude oil, the oil companies did achieve higher than normal rates of return, approximating 20 percent. However, rising costs caused these profit rates to recede. The FTC data, closely track the Compustat returns despite the difference in industry coverage.

## RATES OF RETURN TO EQUITY (AFTER-TAX)

[In percent]

Industry	1971	1972	1973	1974	1975	1976	1977
Compustat:							
Oil and gas extraction.....	6.7	7.2	10.6	19.9	15.0	15.2	14.7
Integrated petroleum and refining.....	10.8	10.0	15.2	18.4	12.9	13.9	13.5
Other manufacturing.....	11.3	12.9	14.4	13.0	12.0	14.4	14.8
FTC:							
Integrated petroleum and refining.....	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	20.0	12.3	13.6	13.2
Other manufacturing.....	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	13.2	11.1	13.6	13.9

<sup>1</sup> Not available.

Sources: Appendix table V-A, V-B, X.

If we combine interest paid and after-tax profits of stockholders as a measure of the earnings of assets employed in the oil business, their ratio to the total amount of assets employed is another indicator of industry profitability. These percentages tell essentially the same story as rates of return to equity. In 1977, returns to oil company



assets were slightly below nonoil manufacturing corporations in the Compustat file. These latter firms averaged a return of 11.5 percent on total assets employed while oil extraction companies earned 10.2 percent and integrated oil and refinery companies earned 9.6 percent. These indicators also show that oil company earnings were relatively unfavorable in pre-1973 years and that 1974 was an extremely profitable year.

RATES OF RETURN ON ASSETS EMPLOYED

[In percent]

Industry	1971	1972	1973	1974	1975	1976	1977
Oil and gas extraction.....	6.0	6.0	8.3	14.0	10.3	10.4	10.2
Integrated petroleum and refining.....	8.9	8.4	11.5	12.8	9.2	9.7	9.6
Other manufacturing.....	9.5	10.5	11.2	10.6	10.2	11.2	11.5

Source: Appendix table X.

Finally, I would call your attention to appendix table IX which the FTC has kindly furnished us. This presents a distribution of rates of return to equity for integrated oil and refinery companies by size of total assets for each year 1974-78. There is no clear relationship between size of company and rate of return except that in each year the very largest size class has earned a below average rate of return. This result is consistent with similar analyses we have made of tax return data; it may either indicate that the largest firms are less efficient, or it may indicate that the largest firms, because they enjoy stability of earnings, can raise funds at lower cost.

FINANCING THE CHANGES IN CAPITAL EMPLOYED BY OIL COMPANIES

We have been requested to provide an analysis of oil company finances in recent years to include both the three major sources of funds—cash flow from operations, new borrowing, and new issues of shares—as well as the application of these funds to distributions to shareholders, outlays for plant and equipment, and investments in the securities of other enterprises. For such data, the only source readily accessible to us is the Compustat file which provides conveniently formatted sources and uses of funds statements beginning with the year 1971. These data, classified by industry as above, are presented in appendix table XI.

SOURCES OF FUNDS

*Cash flow.*—Like any group of long-established firms, oil companies engaged primarily in extraction as well as integrated firms rely heavily on operations for the bulk of their disposable funds. After reducing the net realizations from sales of goods and services for production expenses, net payments of interest, and taxes, the remainder, commonly called “cash flow” accounted in 1977 for 69 and 81 percent of all sources of funds for oil companies as compared with 87 percent for all manufacturing companies. As shown in appendix table XI, total sources of funds include external financing and reductions of working capital (cash, inventories, and net receivables) as well as cash flow from operations.

CASH FLOW  
[Percent of total sources]

	1971	1972	1973	1974	1975	1976	1977
Oil and gas extraction.....	64	58	60	73	65	66	69
Integrated petroleum and refining.....	79	81	84	70	76	74	81
Other manufacturing.....	77	83	85	74	78	85	87

Source: Appendix table XI.

In principle, cash flow consists of two elements: the after-tax income which might be distributed to shareholders and leave the corporation's earning capacity unchanged, and the amount of capital consumed which, if not replaced by new capital outlays, would impair the earning capacity of the corporation. As a practical matter, standard accounting procedures for estimating depreciation and depletion provide no reliable measure of capital consumption, particularly in the oil industry which is characterized by relatively long physical lives of plant and equipment and where the principal assets—oil and gas reserves—defy conventional accounting valuation. Given the long lives of refineries and pipelines, they are particularly susceptible to technical and market-shift obsolescence, exacerbated in the last 15 years by the rapid evolution of environmental regulations that have affected both the nature of refinery products demanded and the processing techniques required. Moreover, the persistence of inflation over the same period has cast further doubt on standard accounting measures of depreciation and depletion because these rely on historic costs. Thus, although the total cash flow from current operations, which is measured in current year dollars, is a reliable figure, its allocation between net income of corporate equity and capital consumption is questionable.

Two further complexities arise in evaluating cash flow because it is reported net of income tax. First, unlike the accounting for sales and expense transactions that underlie the measurement of pretax income, the accounting for tax-related transactions is not uniformly on an accrual basis. For example, the income tax account is used to clear tax refunds pertaining to prior year losses. When this occurs, the "refund" is reported as an addition to current year net income; this "inflates" net (after-tax) income in the year the "refund" is received while causing an overstatement of the loss in the year it was experienced. Similarly, the income tax account is used to clear payment of the investment credit, and this may be accounted for under existing accounting principles as a reduction in tax and, hence, an increase in after-tax income even though the tax subsidy has little to do with income-earning operations of the year in question.

Second, under the tax laws, recovery of depreciable and depletable capital outlays is commonly more accelerated than the comparable capital consumption allowances estimated for financial reporting purposes. For oil companies, tax depreciation allowances tend to be computed by more accelerated methods than are used for financial reporting; and drilling costs are more rapidly written off for tax than for financial reporting purposes. When this occurs, taxable income generated by the company's operations is deferred to later years as compared with the pretax income reported by the corporation for a

given year. By the same token, tax liability for a given year is deferred. Under accepted accounting principles, this condition is reported under the heading "deferred taxes"; and although this source of funds is in the nature of an interest-free loan, it is conventionally reported as a component of cash flow arising from operations. With these qualifications, the reported composition of cash flow for oil companies is:

COMPOSITION OF CASH FLOW  
[Percent of cash flow]

	1971	1972	1973	1974	1975	1976	1977
Net income:							
Oil and gas extraction.....	38	40	46	60	49	51	46
Integrated petroleum and refining.....	52	51	59	62	52	54	52
Other manufacturing.....	53	56	59	56	54	59	60
Capital consumption:							
Oil and gas extraction.....	60	59	52	38	43	52	40
Integrated petroleum and refining.....	45	46	37	33	43	39	40
Other manufacturing.....	45	42	39	40	42	37	37
Deferred taxes:							
Oil and gas extraction.....	2	1	2	2	8	7	14
Integrated petroleum and refining.....	3	3	4	4	5	7	8
Other manufacturing.....	2	2	2	4	4	4	3

Source: Appendix table XI.

The notable distinctions of oil company cash flow as compared with nonoil companies are these: (a) Except in 1974, net income is a smaller contribution to oil company cash flow; (b) correspondingly, capital consumption allowances tend to be relatively more important; and (c) most notably, deferred taxes have become increasingly important. The implication of this latter fact is that tax-preferred capital outlays by oil companies, have been rising since 1974, particularly among oil extraction companies.

*External financing.*—In addition to cash flow, funds may be obtained by the issuance of securities. Cash flow is commonly called "internal financing"; funds obtained by net new borrowing and issuance of stock is called "external financing."

EXTERNAL SOURCES OF FUNDS  
[Percent of total sources]

Source/industry	1971	1972	1973	1974	1975	1976	1977
Long-term debt:							
Oil and gas extraction.....	6	28	4	7	9	20	7
Integrated petroleum and refining.....	14	6	2	8	18	17	10
Other manufacturing.....	5	3	0	16	11	2	5
New stock:							
Oil and gas extraction.....	4	7	12	1	6	3	15
Integrated petroleum and refining.....	0	1	12	1	1	2	2
Other manufacturing.....	9	9	9	2	4	4	0

<sup>1</sup> Net reduction in stock outstanding.

Source: Appendix table XI.

Altogether, external financing accounted for 22 percent of oil extraction company funds in 1977, 12 percent of integrated oil and refining company funds, and but 5 percent of nonoil company funds. The wide annual variation in percentages of funds derived from external sources results from the compounding effect of some variation in the amounts

of securities issued each year and the larger variation in cash flow. In this respect, the oil companies seem to behave no differently than nonoil companies. There is no evidence that oil companies are somehow more reliant on cash flow than companies in other industries.

#### USES OF FUNDS

*Dividends.*—An essential application of corporate funds is the payment of dividends to stockholders. Whatever may be the precise financial policy of a large corporation regarding its retention of after-tax income, it must sustain some level of pay-out to stockholders by way of providing them assurance that their real incomes are being preserved, or enhanced, by management's stewardship. As the following dividend data show, integrated oil companies behave very much like nonoil companies: dividend payouts are a relatively stable fraction of total sources of funds, but a variable fraction of reported net income. Oil extraction companies follow a similar policy, but they pay out much smaller fractions of net income and total sources.

It is worth noting that each of the three categories tends to pay out a declining fraction of reported net income, thereby manifesting a justifiable doubt about the "quality" of reported earnings. Similarly it is notable that in 1973-74, when both classes of oil companies experienced sharp boosts in net earnings, payout fractions dropped dramatically.

#### STOCKHOLDER DISTRIBUTIONS

[Dollar amounts in billions]

Item	1971	1972	1973	1974	1975	1976	1977
<b>Oil and gas extraction:</b>							
Dividends paid .....	\$0.2	\$0.1	\$0.1	\$0.2	\$0.3	\$0.3	\$0.4
Percent of:							
Net income .....	55	36	22	14	25	24	25
All sources .....	13	8	6	6	8	8	8
<b>Integrated petroleum and refining:</b>							
Dividends paid .....	\$3.7	\$3.7	\$4.0	\$4.6	\$4.8	\$5.2	\$5.8
Percent of:							
Net income .....	52	53	35	29	42	38	41
All sources .....	22	22	17	13	17	15	17
<b>Other manufacturing:</b>							
Dividends paid .....	\$8.9	\$9.5	\$10.4	\$11.1	\$11.3	\$13.7	\$16.6
Percent of:							
Net income .....	50	43	38	40	41	37	40
All sources .....	25	25	22	20	21	23	23

Source: Appendix table XI.

#### CAPITAL OUTLAYS

But by far the most important use of funds is for capital outlays. These outlays not only cover replacement of capital consumed—oil and gas productive capacity exhausted by production and obsolescent and wornout plant and equipment—but also any net additions to productive capacity that appear to be economically justified. In accounting for the application of funds during a year, only those outlays which are capitalized, shown as an increase in plant and equipment, are included as use of funds. Repairs, R. & D. expenditures, and, in the case of oil companies, a considerable expenditure for discovery and development, are capital stock maintenance outlays that perform the same function as "capital outlays," but they are netted against gross

income from sales; that is, are accounted for as if they reduced cash flow, not as an application of funds.

CAPITAL OUTLAYS  
[Dollar amounts in billions]

Item	1971	1972	1973	1974	1975	1976	1977
Oil and gas extraction:							
Outlays.....	\$0.8	\$1.1	\$1.5	\$1.9	\$2.4	\$2.6	\$3.3
Percent of:							
Cash flow.....	102	127	125	92	115	110	108
Total sources.....	66	69	71	71	74	74	74
Integrated petroleum and refining:							
Outlays.....	\$11.0	\$10.9	\$11.9	\$19.4	\$20.9	\$22.4	\$24.6
Percent of:							
Cash flow.....	82	81	64	77	113	96	92
Total sources.....	64	64	51	53	72	67	72
Other manufacturing:							
Outlays.....	\$21.1	\$21.1	\$28.7	\$37.1	\$34.3	\$35.6	\$42.8
Percent of:							
Cash flow.....	63	57	62	78	69	58	62
Total sources.....	60	59	61	66	65	61	60

Source: Appendix table XI.

With these precautions in mind, we may observe that, in 1977, oil companies made capital outlays of \$27.9 billion. Extraction companies accounted for \$3.3 billion, an amount exceeding their cash flow by 8 percent that year and equal to 74 percent of their total sources of funds. The remaining \$24.6 billion expended by integrated companies represented 92 percent of their cash flow and 72 percent of their total sources of funds. Extraction companies quadrupled their annual capital outlays between 1971 and 1977 and, except in 1974 when cash flow was swollen by the sharp OPEC price increases in January of that year, outlays throughout the period exceeded 100 percent of cash flow and constituted an increasing proportion of total sources. This is what we would expect for an industry with good profit prospects. The industry's investments would exceed cash flow and the industry would have no difficulty in attracting external financing for its capital outlays.

Expectedly, the integrated companies present an investment behavior pattern between the extraction companies and nonoil corporations. Integrated companies comprise a blend of extraction and manufacturing activities. Thus they generally devote more of both their cash flow and total sources to capital outlays than nonoil companies, except in 1973-74 when they experienced a larger increase in cash flow. Integrated oil companies have more than doubled annual capital outlays and generally increased the fraction of cash flow and total sources of funds devoted to capital formation. And unlike the nonoil companies whose outlays were lower in 1975 and 1976 than they had been in 1974, both classes of oil companies sustained outlay growth.

Before reviewing the last major use of funds, for investments in securities and acquisitions of other firms, I should like to supplement the foregoing review of capital outlay statistics with supplementary data. The financial statistics we have been reviewing cover all the diverse operations of corporations that have been classified as principally engaged in the oil business, and they include both foreign and domestic operations. Since our principal interest today is in invest-

ment expenditures directly related to oil and gas productive capacity in the United States, it is illuminating to examine a statistical series explicitly devoted to such expenditures.

The joint association survey, a compilation prepared by the American Petroleum Institute on behalf of the institute, the Independent Petroleum Association, and the Mid-Continent Oil & Gas Association, has provided estimates of exploration and development expenditures within the United States since 1966; and since 1973, the Bureau of the Census has prepared similar estimates as part of its current industry reports series. Both estimates are based on survey techniques. In 1977, these sources estimated that a total of \$16.9 billion was expended on oil and gas field exploration and development.

## EXPLORATION AND DEVELOPMENT OUTLAYS

(In billions of dollars)

Type	1971	1972	1973	1974	1975	1976	1977
Total exploration.....	\$2.3	\$3.5	\$5.5	\$8.7	\$5.3	\$7.2	\$7.8
Land acquisition.....	.6	1.7	3.6	5.8	1.6	3.0	2.6
Other.....	1.7	1.8	1.9	2.9	3.7	4.2	5.2
Development.....	2.6	3.0	3.0	4.4	6.4	7.7	9.1

Sources: Joint Association Survey and Census Annual Survey of Oil and Gas.

You should bear in mind that this \$16.9 billion of expenditures in 1977 cannot be compared to the \$27.9 billion of capital outlays referred to above; the \$16.9 billion includes expenditures by companies not included in the Compustat file, expenditures that would be financially expensed, and is restricted to U.S. expenditures of this type. Over the period, these expenditures have more than tripled from the \$4.9 billion 1971 level. Except for irregular bulges in land acquisition expenditures—mostly lease bonuses paid for mineral rights—expenditures for this critical kind of capital formation have steadily increased during the period.

*Securities purchases and acquisitions.*—Finally, because economic prospects may not warrant expenditure of all available funds for capital items to be employed in the company's existing lines of activity, and because our income tax laws discourage the payout of currently excess funds to stockholders, funds may be used to acquire other firms (within or outside of the company's own lines of activity) or make investments in securities. Some amount of investment in securities and for the acquisition of other corporations by oil companies has taken place. In 1977 \$672 million of such investments outside the oil companies' existing activities occurred. For the oil extraction companies, this utilized about 1 percent of available funds sources; for integrated refining companies, 2 percent. However, these investments by integrated companies were large in 1974 and 1975; the \$4 billion spent those 2 years represented an increased share of funds already enlarged by the OPEC price increases.

## INVESTMENTS AND ACQUISITIONS

[Dollar amounts in millions]

Item	1971	1972	1973	1974	1975	1976	1977
Oil and gas extraction:							
Funds used.....	\$59	\$48	\$33	\$23	\$44	\$169	\$46
Percent of:							
Cash flow.....	7	6	3	1		7	1
Total sources.....	5	3	2	1		5	1
Integrated petroleum and refining:							
Funds used.....	\$883	\$846	\$574	\$2,611	\$1,438	\$827	\$626
Percent of:							
Cash flow.....	7	6	3	10	8	4	2
Total sources.....	5	5	2	7	5	2	2
Other manufacturing:							
Funds used.....	\$1,118	\$1,533	\$2,036	\$1,230	\$1,312	\$1,380	\$2,651
Percent of:							
Cash flow.....	3	4	4	3	3	2	4
Total sources.....	3	4	4	2	3	2	4

<sup>1</sup> Net reduction in investments; sale of subsidiary.

Source: Appendix table XI.

Two final qualifying observations are in order. First, it should be noted that the investments compiled here only cover mergers and similar combinations that are financed by the direct use of the acquiring company's funds. Thus, in 1974, the purchase of a 54-percent interest in Marcor by Mobil is included in the \$2.6 billion presented above; but the 1976 completion of the merger is not shown, since it was consummated by an exchange of securities. Second, it is worth noting that not all the acquisitions encompassed in the total above take the acquiring company outside the industry in which it is predominantly engaged. Petrochemical companies, refiners, oil producers and other related oil businesses, along with other mineral activities are the most frequent purchases of oil companies. Selected examples of oil company acquisitions in recent years are presented in appendix table XII.

## IMPACT OF PRESIDENT'S PROPOSALS

Phased decontrol of oil will increase the net oil receipts of producers and royalty owners by \$15.4 billion over the 3-year period 1979-81 (assuming no increase in real OPEC prices). These increases in income are essentially windfalls; they are unexpected. When the producers and royalty owners made investments, they never anticipated that oil might rise to \$13 or \$16 a barrel.

If the President's windfall profits tax is not enacted, the producers and royalty owners out of the increased receipts will pay State severance, ad valorem, and income taxes, and the Federal income tax. After paying these taxes, they will have \$8 billion left. The windfall profits tax will further reduce the after-tax revenues from decontrol received by producers and private royalty owners to \$6 billion. Thus the proposed windfall profits tax will reduce the after-tax income received by producers and private royalty owners by 25 percent over the 3-year period, 1979-81.

## DISPOSITION OF NET INCREASE IN OIL RECEIPTS, ASSUMING BASE CASE—NO INCREASE IN REAL OPEC PRICE

	Calendar years				Total 1979-81	Total 1979-82
	1979	1980	1981	1982		
Net increase in oil receipts.....	1.0	5.0	9.3	10.9	15.4	26.3
Net increase in after-tax producer and royalty income:						
Without windfall profits tax.....	.5	2.6	4.9	5.7	8.0	13.7
With windfall profits tax.....	.5	2.1	3.4	3.9	6.0	9.9
Percent reduction due to windfall profits tax.....		18.4	31.3	30.8	25.1	27.4

Source: Appendix table XIII.

If OPEC prices increase by 3 percent in real terms each year, the windfall profits tax will reduce by 40 to 45 percent the amount of money that the oil industry will actually keep as a result of decontrol. The President's proposed windfall profits tax is not the pussycat tax that some have suggested.

## DISPOSITION OF NET INCREASE IN OIL RECEIPTS, ASSUMING ALTERNATE CASE—3 PERCENT INCREASE IN REAL OPEC PRICE

	Calendar years				Total 1979-81	Total 1979-82
	1979	1980	1981	1982		
Net increase in oil receipts.....	1.0	5.3	10.7	13.7	17.0	30.7
Net increase in aftertax producer and royalty income:						
Without windfall profits tax.....	.5	2.5	5.0	6.3	8.1	14.4
With windfall profits tax.....	.5	1.9	2.9	3.5	5.4	8.8
3 percent reduction due to windfall profits tax.....		23.5	42.0	15.4	33.5	38.7

Source: Appendix table XIII.

The Treasury estimates of the impact of this program are by no means static estimates. In fact, they assume considerable response—or feedback, if you will—on domestic crude oil production as the result of the increase in oil prices. By 1985, we assume that scheduled decontrol will increase domestic production by about 1.5 million barrels per day, roughly a 20-percent increase over the volume of production which would have prevailed under continued price controls. Consequently, in calculating our revenue impact we have taken into account not only increased oil receipts resulting from higher prices on production which would have occurred anyway, but also additional increases in oil production receipts resulting from price-induced production increases.

With respect to price-induced production increases, our 40-percent income tax rate is applicable only to net changes in producer's income since higher levels of production obviously are associated with higher levels of deductible production costs. Since this has been an apparent point of confusion leading to some public criticism of our analysis, I have shown in appendix table XIV both the 40-percent Federal income tax rate which would apply to net increases in oil receipts (net of production costs before deduction of State income and severance taxes) as well as the income tax rates which can be applied to the gross increases in oil receipts. This implied Federal income tax rate on gross increases is 34 percent in 1979, when relatively little induced production occurs, and declines to 20 percent by 1985, when induced production accounts for nearly 17 percent of total domestic output.



This concludes my testimony. I would be most pleased to respond to your questions.

[Additional information follows:]

#### NOTES TO APPENDIX TABLES

The following tables are based on four data sources; Statistics of Income (SOI), published by the Internal Revenue Service, Department of the Treasury; Quarterly Financial Report for Manufacturing, Mining and Trade Corporations (QFR), published by the Federal Trade Commission; Survey of Current Business (Survey), published by the Bureau of Economic Analysis, Department of Commerce; and Compustat, a financial service of the Standard and Poor's Corporation. Each data source has its own scope, purpose and severe limitations, some of which are listed below. The user is advised to turn to descriptive material in these documents in conjunction with the use of data in this appendix.

*Statistics of Income.*—Data in the SOI are based on a stratified sample of un-audited tax return information. Industry classification generally conforms with the Enterprise Standard Industrial Classification, designed to classify single activity establishments. Returns are classified into the industry accounting for the largest portion of total receipts. Consolidated returns are generally permitted at the election of the reporting group as long as an 80 percent ownership test is met. In Appendix Table IV, taxable income is allocated between domestic and foreign operations based on foreign taxable income as reported on Form 1118 in support of foreign tax credit claimed. Taxable income and/or loss of corporations not filing this form is allocated to domestic operations. Current tax return tabulations do not permit identification of these amounts.

*Quarterly Financial Report.*—The QFR is based on a stratified sample of Financial Reports that must be filed with the Federal Trade Commission. The reports are based on generally accepted accounting principles. However, one of the goals of the QFR is to isolate domestic from foreign operations. This has resulted in a hybrid report in which the following are important results:

(a) In general consolidation of all domestic operations owned more than 50 percent by a reporting corporation is required.

(b) Foreign entities (corporate or noncorporate), foreign branch operations, and domestic corporations primarily engaged in foreign operations are excluded.

(c) Classification by industry, based on the Enterprise Standard Industrial Classification, is a function of domestic gross receipts contributing the largest portion of total receipts. To minimize reporting burdens, smaller corporations are cycled through the sample in such a way that one-eighth of the respondents are dropped each quarter. The summation of four quarters to derive annual totals is thereby affected to an unknown degree.

*Survey of Current Business.*—Appendix Tables VII-A and B trace the relationship between taxable income and the national income measures of earnings in the petroleum industry. The line items that represent the Bureau of Economic Analysis' (BEA) adjustments are basically those published in the aggregate in the Survey each July in Table 8.5. BEA measures profits from current domestic production, thus the exclusion of foreign income (foreign profits net of corresponding outflows are included in a separate industry, rest-of-the-world). Other adjustments include:

(1) Deletion of all domestic dividends received—this avoids double counting of income when industries are aggregated.

(2) Depreciation vs. expense adjustment—this capitalizes certain capital expenditures that may be deducted currently on the tax return (such as intangible drilling costs).

(3) Oil well bonus payments—this adjustment restores to income bonus payments associated with dry holes and expensed on the return.

(4) State income tax—income is to be measured before all income taxes.

(5) Audit—SOI data are based on unaudited returns. This is an estimate of profit that would be disclosed if all returns were audited and the books were kept in a manner consistent with national income concepts.

*Compustat.*—Compustat is a computer data service provided by a subsidiary of Standard & Poor's Corporation. Financial data, derived from Form 10K reports filed with the SEC, is organized into a common framework for approximately 3,000 large U.S. and Canadian firms. While standard accounting procedures underlie each company's financial statement, practices may vary and consistency cannot be insured. In the event of a merger, only data from the primary company

is retained and the secondary company is dropped from the files. As no attempt is made to adjust the file for these changes in retained company financial data, company and industry data change discretely. The 10K data is considered final and not revised; however, prior to the receipt of a 10K preliminary data from other sources may be posted.

The sources and uses of funds statement in Table XI has been adjusted from the Compustat format by netting certain similar transactions that occur on both sides of the balance sheet, thus reducing totals. Capital expenditures have been defined as gross capital expenditures minus the sales of property, plant and equipment. Issues of long-term debt are net of reductions in long-term debt, and stock issues are defined as new stock issues less purchases of own common and preferred stock. Increases in investments have been reduced by investment sales. Modifications have also been made in the breadth of the categories reported. Operating income, defined net of investment, property and equipment sales, is composed of four items: income including extraordinary items, depreciation and amortization, deferred taxes and a residual. The excess of the total of the above sources over the above total uses represents a decrease in working capital; conversely an excess of the above described uses over sources represents an increase in working capital. The change in working capital balances the accounting for sources with that for uses.

In the balance sheets shown in Table VI, total assets are defined to more closely correspond to assets employed in the business by netting each company's accounts payable against receivables. When the difference is positive—receivables exceed payables—this element of working capital is part of the assets employed; when the difference is negative, trade credit helps finance the assets employed.

Return on equity reported in Table X is computed as income before extraordinary items and discontinued items divided by the sum of reported common equity plus preferred stock at book value. Return on assets is the income to equity as defined in the numerator above plus interest expense and extraordinary income or losses divided by total assets as previously defined. The return on common stock is earnings per share divided by the average of the common stock high and low. Aggregate industry rates of return on equity and assets represent the sum of industry returns divided by the sum of the corresponding denominators. For stock price fluctuations and earnings per share, company ratios are weighted by shares outstanding.

APPENDIX TABLE I-A.—GROSS DOMESTIC PRODUCT TOTAL AND PRODUCT ORIGINATING IN THE PETROLEUM INDUSTRY (EXTRACTION AND REFINING)

(Dollar amounts in billions)

Calendar year	Gross product originating in the petroleum industry						Percent distribution	
	Gross domestic product	Petroleum as percent of total	Total	Employee compensation	Profit-type income	All other components	Employee compensation	Profit-type income
1965.....	\$683.4	2.09	\$14.3	\$4.2	\$3.0	\$7.1	29.4	21.0
1966.....	748.8	1.96	14.7	4.3	3.1	7.3	29.3	21.0
1967.....	791.8	2.03	16.1	4.5	4.0	7.6	28.0	24.8
1968.....	863.7	1.96	16.9	4.9	3.7	8.3	29.0	21.9
1969.....	931.1	1.84	17.1	5.2	3.0	8.8	30.4	17.5
1970.....	977.8	1.86	18.2	5.5	3.2	9.5	30.2	17.6
1971.....	1,056.8	1.74	18.4	5.7	2.6	10.0	31.0	14.1
1972.....	1,164.1	1.71	19.9	6.1	2.9	10.9	30.7	14.6
1973.....	1,297.5	1.75	22.7	6.7	4.5	11.6	29.5	19.8
1974.....	1,399.8	2.25	31.5	8.0	11.7	11.9	25.4	37.1
1975.....	1,518.3	2.21	33.5	9.6	9.8	14.1	28.7	29.2
1976.....	1,685.7	2.47	41.6	11.0	14.4	16.2	26.4	34.6
1977.....	1,869.9	2.55	47.6	12.9	16.7	18.0	27.1	35.1
1978.....	2,087.6	2.56	53.5	15.3	18.4	19.7	28.6	34.4

<sup>1</sup> Preliminary.

Note: Profit-type return consists of proprietor's income with inventory valuation adjustment and without capital consumption adjustment, rental income of persons without capital consumption adjustment, corporate profits with inventory valuation adjustment and without capital consumption adjustment, less subsidies received. All other components include indirect business taxes and nontax liability, business transfer payments, net interest and capital consumption allowances.

Source: Bureau of Economic Analysis (published and unpublished data).

APPENDIX TABLE I-B.—GROSS DOMESTIC PRODUCT, TOTAL AND PRODUCT ORIGINATING IN SELECTED INDUSTRIES

[Dollar amounts in billions]

Calendar year	Gross domestic product originating in—			Percent of gross domestic product originating in—				
	Total	Petroleum extraction and refining	All other manufacturing	All other industries	Total	Petroleum extraction and refining	All other manufacturing	All other industries
1965	\$683.4	\$14.3	\$182.0	\$487.1	100.0	2.09	26.6	71.3
1966	748.8	14.7	201.2	532.9	100.0	1.96	26.9	71.2
1967	791.8	16.1	205.2	570.5	100.0	2.03	25.9	72.1
1968	863.7	16.9	224.9	621.9	100.0	1.96	26.0	72.0
1969	931.1	17.1	237.5	676.5	100.0	1.84	25.5	72.7
1970	977.8	18.2	232.1	727.5	100.0	1.86	23.7	74.4
1971	1,056.8	18.4	243.1	795.3	100.0	1.74	23.0	75.3
1972	1,164.1	19.9	268.9	875.3	100.0	1.71	23.1	75.2
1973	1,297.5	22.7	299.1	975.7	100.0	1.75	23.1	75.2
1974	1,399.8	31.5	303.1	1,065.2	100.0	2.25	21.7	76.1
1975	1,518.3	33.5	316.6	1,168.2	100.0	2.21	20.9	76.9
1976	1,685.7	41.6	361.2	1,282.9	100.0	2.47	21.4	76.1
1977	1,869.9	47.6	404.0	1,418.3	100.0	2.55	21.6	75.8
1978 <sup>1</sup>	2,087.6	53.5	2,034.1		100.0	2.56	97.4	

<sup>1</sup> Preliminary.

Note: Detail may not add to totals due to rounding. For a further description of the content of each industry see table 6.1, Survey of Current Business, Bureau of Economic Analysis.

Source: Bureau of Economic Analysis (published and unpublished data).

APPENDIX TABLE I-C.—CONSTANT DOLLAR GROSS DOMESTIC PRODUCT, BILLIONS OF 1972 DOLLARS, TOTAL AND PRODUCT ORIGINATING IN SELECTED INDUSTRIES

[Dollar amounts in billions]

Calendar year	Gross domestic product originating in—			Percent of gross domestic product originating in—				
	Total	Petroleum extraction and refining	All other manufacturing	All other industries	Total	Petroleum extraction and refining	All other manufacturing	All other industries
1965	\$919.9	\$16.3	\$218.8	\$684.8	100.0	1.77	23.8	74.4
1966	975.6	16.9	237.1	721.6	100.0	1.73	24.3	74.0
1967	1,001.9	17.4	236.7	747.8	100.0	1.74	23.6	74.6
1968	1,045.7	18.3	250.1	777.3	100.0	1.75	23.9	74.3
1969	1,073.1	18.5	257.7	795.9	100.0	1.72	24.0	74.3
1970	1,069.8	19.5	241.1	809.2	100.0	1.82	22.5	75.6
1971	1,100.3	19.6	244.5	836.2	100.0	1.78	22.2	76.0
1972	1,164.1	19.9	268.9	875.3	100.0	1.71	23.1	75.2
1973	1,227.4	20.2	292.8	914.4	100.0	1.65	23.9	74.5
1974	1,211.0	20.0	271.9	919.1	100.0	1.65	22.5	75.9
1975	1,197.5	20.1	257.0	920.4	100.0	1.58	21.5	76.9
1976	1,264.3	20.4	282.8	961.1	100.0	1.61	22.4	76.0
1977	1,325.3	21.5	300.8	1,003.0	100.0	1.62	22.7	75.7
1978 <sup>1</sup>	1,377.5	22.7	1,354.8		100.0	1.65	98.4	

<sup>1</sup> Preliminary.

Note: Detail may not add to totals due to rounding. For a further description of the content of each industry see table 6.1, Survey of Current Business, Bureau of Economic Analysis.

Source: Bureau of Economic Analysis (published and unpublished data).

APPENDIX TABLE II.—CALENDAR YEAR 1975, PETROLEUM REFINING AND INTEGRATED COMPANIES <sup>1</sup>

[Dollar amounts in millions]

Asset size (in millions)	Statistics of income					In percent			
	Stock holders' equity	Income subject to tax	Net Federal income tax	Taxable income after tax	Worldwide sales	Taxable income per dollar of stockholders' equity	Table income after tax per dollar of stockholders' equity	Taxable income per dollar of sales	Number of returns
Under \$5.....	\$250	\$57	\$22	\$35	\$1,273	22.8	14.0	4.5	1,509
\$5 under \$10.....	63	23	10	13	355	36.5	20.6	6.5	22
\$10 under \$25.....	208	44	16	28	745	21.1	13.5	5.9	26
\$25 under \$50.....	116	56	25	31	864	48.3	26.7	6.5	10
\$50 under \$100.....	786	181	76	105	2,611	23.0	13.4	6.9	12
\$100 under \$250.....	882	102	38	64	4,399	11.6	7.3	2.3	15
\$250 or more.....	85,992	15,559	1,877	13,682	249,232	18.1	15.9	6.2	28
<b>Total.....</b>	<b>88,297</b>	<b>16,022</b>	<b>2,064</b>	<b>13,958</b>	<b>259,479</b>	<b>18.6</b>	<b>15.8</b>	<b>6.2</b>	<b>1,622</b>
	Quarterly financial report					In percent			
	Stock holders' equity	Net income before tax	Provision for income tax	Net income after tax	Sales (domestic)	Net income before tax per dollar of stockholders' equity	Net income after tax per dollar of stockholders' equity	Net income per dollar of sales	Number of returns
Under \$5.....	\$218	\$63	\$24	\$39	\$981	28.9	17.9	6.4	(C)
\$5 under \$10.....	40	34	16	18	191	85.0	45.0	17.8	(C)
\$10 under \$25.....	153	85	34	51	1,202	55.6	33.3	7.1	(C)
\$25 under \$50.....	140	44	21	23	542	31.4	16.4	8.1	(C)
\$50 under \$100.....	166	77	36	41	1,011	46.4	24.7	7.6	(C)
\$100 under \$250.....	1,166	241	102	139	4,875	20.7	11.9	4.9	(C)
\$250 or more.....	74,047	12,763	3,771	8,992	112,955	17.2	12.1	11.3	(C)
<b>Total.....</b>	<b>75,930</b>	<b>13,307</b>	<b>4,004</b>	<b>9,303</b>	<b>121,757</b>	<b>17.5</b>	<b>12.3</b>	<b>10.9</b>	<b>(C)</b>

<sup>1</sup> Excludes companies classified in the oil and gas extraction industry. Includes coal products. Classification is based on the Enterprise Standard Classification Manual.

<sup>2</sup> Not available.

Sources: Statistics of Income—Tax return data compiled by the Statistics Division, Internal Revenue Service. Quarterly Financial Report—Financial reports filed with the Federal Trade Commission.

APPENDIX TABLE III.—PETROLEUM EXTRACTION AND REFINING, SELECTED TAX RETURN INCOME STATEMENT ITEMS BY LEGAL FORM OF BUSINESS<sup>1</sup>

(Dollars in millions)

	1973					1974				
	Corporations	Sole proprietors	Partnerships	Total	Percent corporate	Corporations	Sole proprietors	Partnerships	Total	Percent corporate
Total receipts.....	\$145,688	\$1,571	\$1,182	\$148,441	98.1	\$313,487	\$2,448	\$2,367	\$318,302	98.5
Sales.....	139,074	1,540	1,082	141,696	98.1	304,648	2,382	2,233	309,263	98.5
Other.....	6,614	31	100	6,745	98.1	8,839	66	134	9,039	97.8
Total deductions.....	131,991	1,616	1,750	135,357	97.5	276,686	2,169	2,638	281,493	98.3
Costs of sales and operations.....	97,702	285	283	98,270	99.4	228,065	366	468	228,899	99.6
Depletion.....	6,160	194	124	6,478	95.1	14,456	332	350	15,138	95.5
Other.....	28,129	1,137	1,343	30,609	91.9	34,165	1,471	1,820	37,456	91.2
Net income (less loss).....	13,683	-45	-568	13,070	104.7	36,787	279	-271	36,795	100.0
Net income.....	14,032	219	265	14,516	96.7	37,094	536	737	38,367	96.7
Net loss.....	350	264	833	1,447	24.2	307	257	1,008	1,572	19.5
Number of returns (thousands).....	8	50	13	71	11.3	9	49	12	70	12.9
	1975					1976 <sup>2</sup>				
	Corporations	Sole proprietors	Partnerships	Total	Percent corporate	Corporations	Sole proprietors	Partnerships	Total	Percent corporate
Total receipts.....	\$311,758	\$2,910	\$2,839	\$317,507	98.2	\$367,086	\$3,222	\$3,886	\$374,194	98.1
Sales.....	303,088	2,843	2,627	308,558	98.2	354,705	3,147	3,499	361,351	98.2
Other.....	8,670	67	212	8,949	96.9	12,381	75	387	12,843	96.4
Total deductions.....	272,261	2,660	3,468	278,389	97.8	319,735	3,031	3,266	326,032	98.1
Costs of sales and operations.....	229,137	483	604	230,224	99.5	270,755	510	543	271,808	99.6
Depletion.....	1,669	353	234	2,256	75.0	1,607	428	107	2,142	75.0
Other.....	41,455	1,824	2,630	45,909	90.3	47,373	2,093	2,616	52,082	91.0
Net income (less loss).....	39,476	251	-629	39,098	101.0	48,827	191	619	49,637	98.4
Net income.....	39,931	588	1,027	41,546	96.0	49,568	636	1,755	51,959	95.4
Net loss.....	455	337	1,657	2,449	18.6	741	445	1,136	2,322	31.9
Number of returns (thousands).....	9	49	13	71	12.7	10	53	15	78	12.8

<sup>1</sup> Includes constructive taxable income from related foreign corporations.

<sup>2</sup> Preliminary.

Source: Corporation and Business Statistics of Income.

APPENDIX TABLE IV.—INCOME AND TAXES—FOREIGN VERSUS DOMESTIC (BASED ON TAX RETURNS) CORPORATIONS

[In millions of dollars]

	1972			1975			1976		
	Foreign operations (as reported on form 1118 in support of foreign tax credit claimed)	Domestic operations	Total	Foreign operations (as reported on form 1118 in support of foreign tax credit claimed)	Domestic operations	Total	Foreign operations (as reported on form 1118 in support of foreign tax credit claimed)	Domestic operations	Total
<b>Crude petroleum and natural gas extraction:</b>									
Income subject to tax.....	2,921	300	3,221	10,985	1,139	22,124	27,525	1,409	28,934
U.S. Federal income tax, gross <sup>1</sup> .....	1,402	139	1,541	10,073	528	10,601	13,212	643	13,855
Credits claimed, total.....	1,394	19	1,413	10,073	76	10,149	13,191	98	13,289
Foreign tax credit.....	1,394	-----	1,394	10,073	-----	10,073	13,191	-----	13,191
Investment tax credit <sup>4</sup> .....	-----	19	19	-----	75	75	-----	98	98
Other credits.....	-----	-----	-----	-----	-----	-----	-----	-----	-----
U.S. Federal income tax, net.....	8	120	129	-----	453	452	21	545	566
Effective tax rate (percent).....	0.3	40.0	4.0	-----	39.8	2.0	0.1	38.7	2.0
<b>Petroleum refining (including integrated):</b>									
Income subject to tax.....	3,839	721	4,560	10,806	5,216	16,022	8,925	8,784	17,709
U.S. Federal income tax, gross <sup>1</sup> .....	1,842	451	2,293	5,187	2,454	7,641	4,284	4,134	8,418
Credits claimed, total.....	1,559	132	1,691	5,067	509	5,577	4,093	1,058	5,151
Foreign tax credit.....	1,559	-----	1,559	5,067	-----	5,067	4,093	-----	4,093
Investment tax credit <sup>4</sup> .....	-----	132	132	-----	509	509	-----	1,042	1,042
Other credits.....	-----	-----	-----	-----	-----	-----	-----	16	16
U.S. Federal income tax, net.....	283	319	602	120	1,945	2,064	191	3,076	3,267
Effective tax rate (percent).....	7.4	44.2	13.2	1.1	37.3	12.9	2.1	35.0	18.4

<sup>1</sup> Preliminary.

<sup>2</sup> Includes (under domestic operations) additional tax for tax preferences: 1972, \$9,000,000, 1975, \$15,000,000, 1976, \$25,000,000.

<sup>3</sup> Assumed to accrue at 48 percent.

<sup>4</sup> Allocated to domestic operations.

<sup>5</sup> Includes (under domestic operations) additional tax for tax preferences: 1972, \$166,000,000, 1975, \$32,000,000, 1976, -----).

Note: (1) For a particular firm, net U.S. liability on foreign operations may be offset by negative liability due to domestic losses. (2) Foreign losses of firms not claiming a foreign tax credit and therefore, not reported as part of form 1118 taxable income (less loss) will be reflected in the domestic operations column.

Source: Corporation Statistics of Income and Treasury estimates.

APPENDIX TABLE V-A.—SELECTED BALANCE SHEET AND INCOME STATEMENT ITEMS AS MEASURED IN FINANCIAL REPORTS FILED WITH THE FEDERAL TRADE COMMISSION, PETROLEUM REFINING AND INTEGRATED COMPANIES<sup>1</sup>

[Dollar amounts in millions]

	Calendar years				
	1974	1975	1976	1977	1978
<b>Balance sheet:</b>					
<b>Assets</b> .....	\$114,819	\$122,667	\$143,017	\$155,462	\$171,374
Cash, U.S. Government and other securities.....	10,077	9,421	10,683	8,346	8,841
Inventories.....	7,451	8,050	10,368	12,734	12,670
Depreciable and amortizable fixed assets including construction work in progress.....	76,701	84,061	96,827	108,891	122,766
Deduct: Accumulated depreciation, depletion, and amortization.....	41,770	45,314	50,413	54,091	60,120
All other assets.....	62,360	66,449	75,552	79,582	87,217
<b>Liabilities</b> .....	42,374	46,738	56,885	63,360	73,036
Long-term debt due in more than 1 year.....	14,352	16,237	20,606	23,810	24,299
Other liabilities.....	28,022	30,501	36,279	39,550	48,737
<b>Stockholders' equity</b> .....	72,445	75,929	86,133	92,103	98,337
<b>Income statement:</b>					
Net sales, receipts, and operating ratios.....	113,496	121,762	141,345	162,291	177,738
Income (or loss) before income taxes and extraordinary items.....	14,425	11,670	14,573	15,072	15,548
Provision for current and deferred domestic income taxes:					
Federal.....	2,831	3,618	4,700	5,130	5,682
State and local.....	404	387	476	482	606
Net income (or loss) of foreign branches and equity in earnings (or losses) of domestic and foreign nonconsolidated entities and investments accounted for by the equity method, net of foreign taxes.....	3,293	1,640	2,330	2,718	3,535
Income (or loss) after income taxes.....	14,483	9,307	11,725	12,179	12,795
Cash dividends charged to retained earnings.....	3,949	4,245	4,479	5,007	5,443
<b>Operating ratios (percent):</b>					
Rate of profits on stockholders equity at end of period:					
Before income taxes.....	24.5	17.5	19.6	19.3	19.4
After income taxes.....	20.0	12.3	13.6	13.2	13.0
Ratio of long-term debt to equities at end of period.....	19.8	21.4	23.9	25.9	24.7

<sup>1</sup> Excludes companies classified in the oil and gas extraction industry. Includes coal products. Classification is based on the Enterprise Standard Industrial Classification.

TABLE V-B.—SELECTED BALANCE SHEET AND INCOME STATEMENT ITEMS AS MEASURED IN FINANCIAL REPORTS FILED WITH THE FEDERAL TRADE COMMISSION—ALL OTHER MANUFACTURERS

[In millions of dollars]

	Calendar year—				
	1974	1975	1976	1977	1978
<b>Balance sheet:</b>					
<b>Assets</b> .....	654,135	688,243	740,843	807,534	914,976
Cash, U.S. Government and other securities.....	37,180	49,265	58,736	59,877	62,012
Inventories.....	172,251	165,907	176,662	187,762	210,547
Depreciable and amortizable fixed assets including construction work in progress.....	385,051	414,330	439,633	476,085	527,651
Deduct: Accumulated depreciation, depletion, and amortization.....	192,712	205,683	217,574	232,210	252,968
All other assets.....	252,365	264,424	283,386	316,020	367,734
<b>Liabilities</b> .....	318,215	328,716	351,636	387,909	450,134
Long-term debt due in more than 1 yr.....	115,767	128,962	132,954	143,453	157,442
Other liabilities.....	202,448	199,754	218,682	244,456	292,692
<b>Stockholders' equity</b> .....	335,920	359,527	389,206	419,624	464,844
<b>Income statement:</b>					
Net sales, receipts, and operating ratios.....	947,067	943,453	1,061,888	1,165,772	1,320,099
Income (or loss) before income taxes and extraordinary items.....	67,727	59,816	79,167	87,949	101,116
Provision for current and deferred domestic income taxes:					
Federal.....	27,041	23,496	31,181	34,538	39,722
State and local.....	3,119	3,293	4,045	4,595	5,396
Net income (or loss) of foreign branches and equity in earnings (or losses) of domestic and foreign nonconsolidated entities and investments accounted for by the equity method, net of foreign taxes.....	6,697	6,801	8,851	9,372	12,521
Income (or loss) after income taxes.....	44,264	33,828	52,794	58,187	68,519
Cash dividends charged to retained earnings.....	15,518	15,723	18,284	21,578	23,517

See footnote at end of table.

TABLE V-B.—SELECTED BALANCE SHEET AND INCOME STATEMENT ITEMS AS MEASURED IN FINANCIAL REPORTS FILED WITH THE FEDERAL TRADE COMMISSION—ALL OTHER MANUFACTURERS—Continued

[In millions of dollars]

	Calendar year—				
	1974	1975	1976	1977	1978
<b>Operating ratios (percent):</b>					
Rate of profits on stockholders equity at end of period:					
Before income taxes.....	22.2	18.5	22.6	23.2	24.4
After income taxes.....	13.2	11.1	13.6	13.9	14.7
Ratio of long-term debt to equities at end of period.....	34.5	35.9	34.2	34.2	33.9

Source: Office of the Secretary of the Treasury, Office of Tax Analysis, May 2, 1979.



TABLE VI.—BALANCE SHEET ITEMS, 1969-77 OIL AND GAS EXTRACTION COMPANIES

[Dollar amounts in millions]

	1969		1970		1971		1972		1973	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
<b>Assets:</b>										
Total	\$6,242,165	1.00	\$6,922,079	1.00	\$7,564,700	1.00	\$8,386,287	1.00	\$9,558,634	1.00
Adjusted current	978,393	.16	1,071,169	.15	1,074,255	.14	1,283,134	.15	1,565,191	.16
Plant (net)	4,191,792	.67	4,671,703	.67	5,200,194	.69	5,804,799	.69	6,613,616	.69
Investments	886,588	.14	964,546	.14	1,015,936	.13	972,042	.12	975,038	.10
Intangibles	61,838	.01	65,483	.01	70,200	.01	75,192	.01	74,066	.01
All other	123,554	.02	149,178	.02	204,115	.03	251,120	.03	330,723	.03
<b>Liabilities:</b>										
Total	6,242,165	1.00	6,922,079	1.00	7,564,700	1.00	8,386,287	1.00	9,558,634	1.00
Adjusted current	264,889	.04	343,249	.05	382,665	.05	460,711	.05	565,941	.06
Long-term debt	1,420,696	.23	1,629,867	.24	1,808,947	.24	2,196,072	.26	2,324,145	.24
Deferred tax	83,561	.01	144,595	.02	170,746	.02	160,812	.02	223,051	.02
Net worth	4,473,019	.72	4,804,368	.69	5,202,342	.69	5,568,692	.66	6,445,497	.67
	1974		1975		1976		1977			
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent		
<b>Assets:</b>										
Total	\$11,492,282	1.00	\$13,201,963	1.00	\$15,266,569	1.00	\$17,612,108	1.00		
Adjusted current	2,180,156	.19	2,581,158	.20	2,773,982	.18	2,891,806	.16		
Plant (net)	7,990,712	.70	9,405,793	.71	11,043,503	.72	13,153,103	.75		
Investments	861,160	.07	843,702	.06	850,863	.06	934,510	.05		
Intangibles	44,016	.00	38,121	.00	23,459	.00	14,845	.00		
All other	416,238	.04	333,189	.03	574,762	.04	617,844	.04		
<b>Liabilities:</b>										
Total	11,492,282	1.00	13,201,963	1.00	15,266,569	1.00	17,612,108	1.00		
Adjusted current	892,474	.08	1,002,835	.08	999,091	.07	1,109,850	.06		
Long-term debt	2,664,251	.23	2,928,177	.22	3,637,998	.24	4,002,762	.23		
Deferred tax	421,425	.04	801,320	.06	999,706	.07	1,469,901	.08		
Net worth	7,514,132	.65	8,469,631	.64	9,629,774	.63	11,029,595	.63		



		1969		1970		1971		1972		1973	
		Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
<b>NONOIL COMPANIES</b>											
<b>Assets:</b>											
Total	-----	\$216,990,156	1.00	\$238,050,297	1.00	\$260,006,105	1.00	\$280,283,520	1.00	\$315,533,937	1.00
Adjusted current	-----	91,013,682	.42	96,661,350	.41	109,156,725	.42	120,210,756	.43	139,637,738	.44
Plant (net)	-----	99,088,739	.46	109,408,814	.46	116,577,962	.45	123,329,785	.44	135,560,578	.43
Investments	-----	14,027,739	.06	16,164,098	.07	17,760,677	.07	18,695,288	.07	20,733,397	.07
Intangibles	-----	5,925,714	.03	7,474,981	.03	8,120,883	.03	8,820,066	.03	9,466,625	.03
All other	-----	6,934,285	.03	8,341,055	.04	8,389,861	.03	9,227,629	.03	10,135,605	.03
<b>Liabilities:</b>											
Total	-----	216,990,156	1.00	238,050,297	1.00	260,006,105	1.00	280,283,520	1.00	315,533,937	1.00
Adjusted current	-----	16,388,261	.08	19,797,297	.08	21,630,807	.08	20,526,821	.07	29,380,314	.09
Long-term debt	-----	44,806,447	.21	51,581,968	.22	57,194,508	.22	61,906,708	.22	66,319,339	.21
Deferred tax	-----	4,323,700	.02	5,022,450	.02	5,975,493	.02	6,718,542	.02	8,162,014	.03
Net worth	-----	151,471,750	.70	161,648,584	.68	175,205,299	.67	191,131,449	.68	211,672,273	.67
		1974		1975		1976		1977			
		Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent		
<b>Assets:</b>											
Total	-----	\$359,325,840	1.00	\$381,500,676	1.00	\$425,550,680	1.00	\$469,322,320	1.00		
Adjusted current	-----	162,131,551	.45	168,901,949	.44	195,331,633	.46	212,339,598	.45		
Plant (net)	-----	153,780,918	.43	167,146,443	.44	181,567,088	.43	201,262,932	.43		
Investments	-----	22,297,063	.06	23,884,401	.06	26,633,743	.06	30,365,359	.06		
Intangibles	-----	10,491,415	.03	10,249,244	.03	10,246,001	.02	10,979,015	.02		
All other	-----	10,624,895	.03	11,318,645	.03	11,772,219	.03	14,374,523	.03		
<b>Liabilities:</b>											
Total	-----	359,325,840	1.00	381,500,676	1.00	425,550,680	1.00	469,322,320	1.00		
Adjusted current	-----	41,127,946	.11	35,942,015	.09	43,752,717	.10	48,405,676	.10		
Long-term debt	-----	77,530,019	.22	84,785,857	.22	87,028,387	.20	93,749,728	.20		
Deferred tax	-----	9,790,174	.03	11,992,367	.03	14,699,368	.03	16,665,413	.04		
Net worth	-----	230,877,703	.64	248,780,437	.65	280,070,211	.66	310,501,508	.66		

TABLE VII-A.— CORPORATIONS CLASSIFIED IN THE CRUDE PETROLEUM AND NATURAL GAS EXTRACTION INDUSTRY RECONCILIATION OF TAXABLE INCOME PER RETURNS AND PRETAX EARNING PER NATIONAL INCOME AND PRODUCT ACCOUNTS

[In millions of dollars]

	Calendar years—											
	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976 <sup>1</sup>
Corporation Statistics of Income: Income subject to tax.....	882	1,060	1,091	1,228	1,253	1,398	2,141	3,221	6,028	23,494	22,124	28,934
Plus:												
Net operating loss deduction.....	53	33	77	57	59	43	68	56	92	207	115	183
Dividends received deduction.....	17	12	15	18	13	15	45	291	49	143	29	66
WHT deduction.....	5	1	1	2	1	2	3	31	49	8	9	16
DISC and subch. S net income.....	27	17	15	14	12	12	22	18	39	80	73	44
Other.....	-4		-3			-7						35
Equals: Net income, returns with net income.....	980	1,121	1,196	1,317	1,336	1,463	2,279	3,325	6,206	23,832	22,349	29,278
Plus:												
Deficits, returns without net income.....	-151	-189	-226	-141	-223	-284	-304	-303	-303	-252	-380	-437
Tax-exempt interest.....	2	4	3	4	3	4	4	3	2	4	4	3
Less: Foreign taxable income constructively received.....		12	1	1	7	3	1	2	3	2	17	34
Equals: Total receipts less total deductions.....	831	924	971	1,180	1,111	1,180	1,978	3,023	5,902	23,582	21,955	28,810
Bureau of Economic Analysis adjustments: Subtract:												
Foreign income included in total receipts less total deductions:												
Foreign dividends.....	8	1	8	9	9	10	8	8	13	14	19	(2)
WHT deduction.....	5	1	1	2	1	2	3	3	1	8	9	(2)
Other foreign income.....	681	902	904	1,043	1,068	1,202	1,845	2,897	5,567	22,646	20,595	(2)
Domestic dividends received.....	22	22	21	23	23	20	62	45	53	66	69	(2)
Gain, sale of assets.....	139	59	100	83	96	89	51	159	156	253	233	(2)
Add: Domestic depletion.....	247	218	322	229	255	233	275	294	286	415	332	(2)
Depreciation versus expense adjustment.....	39	28	28	21	35	26	11	39	44	144	275	(2)
Oil well bonus payments.....	8	8	8	8	10	10	11	12	13	21	29	(2)
State income tax.....	5	4	5	7	8	12	14	19	27	56	80	(2)
Audit.....	27	28	30	37	52	48	45	46	49	55	74	(2)
Other (net).....	4	5	-4	6	-8	-31	-5	-30	-17	-8	-33	(2)
Equals: Corporate profits (current domestic production; national income product accounts).....	306	230	326	328	266	155	360	291	514	1,278	1,787	1,777

<sup>1</sup> Preliminary.  
<sup>2</sup> Not available.

Note: Details may not add to totals due to rounding.  
 Sources: Corporation Statistics of Income (IRS), and Bureau of Economic Analysis.

TABLE VII-B.—CORPORATIONS CLASSIFIED IN THE PETROLEUM AND COAL PRODUCTS (MANUFACTURING) INDUSTRY RECONCILIATION OF TAXABLE INCOME PER RETURNS AND PRETAX EARNINGS PER NATIONAL INCOME AND PRODUCT ACCOUNTS

[In millions of dollars]

	Calendar year—											
	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976 <sup>1</sup>
Corporation Statistics of Income: Income subject to tax.....	2,427	3,199	3,511	3,424	3,398	3,677	4,560	4,560	7,505	14,359	16,022	17,709
Plus:												
Net operating loss deduction.....	37	18	62	22	19	11	13	14	38	105	48	22
Dividends received deduction.....	424	513	551	629	507	822	932	1,255	38	5,053	231	2,265
WHT deduction.....	136	134	166	138	107	121	169	149	2,856	707	1,271	286
DISC and Subchapter S net income.....	3	2	10	1	6	6	12	10	9	19	11	17
Other.....										-61		-9
Equals: Net income, returns with net income.....	3,026	3,864	4,300	4,214	4,036	4,637	5,685	5,987	10,408	20,182	17,582	20,290
Plus:												
Deficits, returns without net income.....	-37	-26	-20	-48	-37	-38	-57	-64	-47	-55	-75	-304
Tax-exempt interest.....	3	6	11	8	12	8	2	3	10	11	28	10
Less: Foreign taxable income constructively received.....	67	124	80	62	90	105	108	147	506	958	505	1,466
Equals: Total receipts less total deductions.....	2,925	3,719	4,212	4,111	3,870	4,502	5,522	5,779	9,865	19,180	17,029	18,531
Bureau of Economic Analysis Adjustments:												
Subtract:												
Foreign income included in total receipts less total deductions:												
Foreign dividends.....	570	542	506	467	815	832	1,011	1,331	1,393	2,869	1,361	( <sup>2</sup> )
WHT deduction.....	136	134	166	138	107	121	169	149	317	707	1,271	( <sup>2</sup> )
Other foreign income.....	887	918	1,371	1,556	1,477	1,482	2,338	1,973	3,342	5,850	9,626	( <sup>2</sup> )
Domestic dividends received.....	502	604	649	744	598	968	1,102	1,486	3,015	5,986	321	( <sup>2</sup> )
Gain, sale of assets.....	122	490	209	212	328	187	162	294	170	251	974	( <sup>2</sup> )
Add: Domestic depletion.....	1,415	1,501	1,774	1,889	1,865	1,760	2,022	2,097	2,622	4,670	768	( <sup>2</sup> )
Depreciation versus expense adjustment.....	221	194	155	173	256	214	94	330	370	1,210	2,309	( <sup>2</sup> )
Oil well bonus payments.....	252	260	258	265	316	307	336	350	434	678	952	( <sup>2</sup> )
State income tax.....	25	45	52	48	43	79	80	89	156	332	367	( <sup>2</sup> )
Audit.....	216	219	285	308	354	392	371	338	335	415	525	( <sup>2</sup> )
Other (net).....	6	-143	-33	-64	-55	-7	-45	-44	-40	-129	-104	( <sup>2</sup> )
Equals: Corporate profits (current domestic production; national income product accounts).....	2,843	3,197	3,820	3,623	3,324	3,657	3,597	3,606	5,505	10,773	8,293	11,704

<sup>1</sup> Preliminary.  
<sup>2</sup> Not available.

Note: Details may not add to totals due to rounding.  
Sources: Corporation Statistics of Income (IRS), and Bureau of Economic Analysis.

TABLE VIII.—CORPORATIONS—PETROLEUM (EXTRACTION AND REFINING) EARNINGS AND NET FEDERAL TAX LIABILITY AS MEASURED IN THE NATIONAL INCOME AND PRODUCT ACCOUNTS

[In millions of dollars]

	Calendar years—												
	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	<sup>1</sup> 1976	<sup>1</sup> 1977
Corporate profits before tax:													
Petroleum and coal products.....	\$2,843	\$3,197	\$3,820	\$3,623	\$3,324	\$3,657	\$3,597	\$3,606	\$5,505	\$10,773	\$8,293	\$11,704	\$12,944
Crude petroleum and natural gas extraction.....	306	230	326	328	266	155	360	291	514	1,278	1,787	1,777	2,137
Total.....	3,149	3,427	4,146	3,951	3,590	3,812	3,957	3,897	6,019	12,051	10,080	13,481	15,081
Federal, State, and local corporate profits tax liability:													
Petroleum and coal products.....	405	679	684	620	519	746	727	754	1,282	2,518	2,517	3,939	4,306
Crude petroleum and natural gas extraction.....	74	53	47	76	67	84	101	126	194	405	492	588	761
Total.....	479	732	731	696	586	830	828	880	1,476	2,923	3,009	4,527	5,067
State and local.....	30	49	57	55	51	91	94	108	183	388	447	711	( <sup>2</sup> )
Federal.....	449	683	674	641	535	739	734	772	1,293	2,535	2,562	3,816	( <sup>2</sup> )
Federal corporate profits tax liability as percent of profits less state and local income tax.....	14.4	20.2	16.5	16.5	15.1	19.9	19.0	20.4	22.2	21.7	26.6	29.9	-----

<sup>1</sup> Preliminary.  
<sup>2</sup> Not available.

Note: Details may not add to totals due to rounding.  
Source: Bureau of Economic Analysis.

**TABLE IX.—PETROLEUM REFINING AND INTEGRATED COMPANIES—RETURN ON STOCKHOLDERS' EQUITY AS MEASURED IN FINANCIAL REPORTS FILED WITH THE FEDERAL TRADE COMMISSION**

Asset size (millions)	Calendar year—				
	1974	1975	1976	1977	1978
<b>Net income after tax<sup>1</sup> per dollar of stockholders' equity:</b>					
Under \$5.....	\$33.5	\$17.9	\$12.6	\$24.6	\$16.0
\$5 under \$10.....	31.0	45.0	28.2	34.1	33.7
\$10 under \$25.....	41.9	33.3	32.6	13.3	17.2
\$25 under \$50.....	23.7	16.4	30.9	22.0	16.8
\$50 under \$100.....	35.8	24.7	18.7	26.7	15.5
\$100 under \$250.....	15.5	11.9	14.4	17.6	16.2
\$250 under \$1,000.....	28.5	14.7	16.2	15.2	16.8
\$1,000 and over.....	19.8	12.1	13.5	13.0	12.8
<b>Total.....</b>	<b>20.0</b>	<b>12.3</b>	<b>13.6</b>	<b>13.2</b>	<b>13.0</b>
<b>Net income before tax<sup>2</sup> per dollar of stockholders' equity:</b>					
Under \$5.....	47.3	28.9	20.6	36.2	41.1
\$5 under \$10.....	52.4	85.0	50.0	51.1	41.6
\$10 under \$25.....	76.7	55.6	65.1	21.0	26.7
\$25 under \$50.....	42.4	31.4	57.0	41.0	33.6
\$50 under \$100.....	60.8	46.4	35.9	39.0	24.3
\$100 under \$250.....	24.9	20.7	21.0	30.0	24.5
\$250 under \$1,000.....	40.6	22.2	25.5	24.3	30.0
\$1,000 and over.....	23.9	17.1	19.2	18.8	19.0
<b>Total.....</b>	<b>24.5</b>	<b>17.5</b>	<b>19.6</b>	<b>19.3</b>	<b>19.4</b>

<sup>1</sup> Excludes companies classified in the oil and gas extraction industry. Includes coal products. Classification is based on the Enterprise Standard Industrial Classification Manual.

<sup>2</sup> Excludes extraordinary gains or losses and minority stockholders' interest in income or loss of consolidated corporations.

Source: Federal Trade Commission, Quarterly Financial Report (unpublished data).

**TABLE X.—SELECTED RATES OF RETURN, OIL COMPANIES AND OTHERS, 1969-77**

[In Percent]

Item	1969	1970	1971	1972	1973	1974	1975	1976	1977
<b>Rate of return to equity:</b>									
Oil and gas extraction.....	12.6	11.4	6.7	7.2	10.6	19.9	15.0	15.2	14.7
Integrated petroleum and refining.....	11.1	10.5	10.8	10.0	15.2	18.4	12.9	13.9	13.5
Others.....	12.4	10.3	11.3	12.9	14.4	13.0	12.0	14.4	14.8
<b>Rate of return to assets employed:</b>									
Oil and gas extraction.....	9.0	8.5	6.0	6.0	8.3	14.0	10.3	10.4	10.2
Integrated petroleum and refining.....	9.2	8.5	8.9	8.4	11.5	12.8	9.2	9.7	9.6
Others.....	10.0	8.9	9.5	10.5	11.2	10.6	10.2	11.2	11.5
<b>Rate of return to market value of equity:</b>									
Oil and gas extraction.....	4.6	6.2	2.9	3.0	4.9	11.7	9.9	8.5	9.1
Integrated petroleum and refining.....	6.9	9.0	8.4	7.4	11.2	18.4	13.4	13.0	12.7
Others.....	4.8	4.8	4.7	4.9	6.2	8.4	8.1	8.7	10.3

Source: Standard & Poor's Corp. Compustat File.

TABLE XI.—SOURCES AND USES OF FUNDS, 1971-77

[Dollar amounts in millions]

	1969		1970		1971		1972		1973	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
<b>OIL AND GAS EXTRACTION COMPANIES</b>										
Sources: All sources.....	0	0	0	0	\$1,243,012	100.00	\$1,550,229	100.00	\$2,125,057	100.00
Work. cap. dec.....	0	0	0	0	48,888	3.93	0	0	0	0
Operations.....	0	0	0	0	807,679	64.98	845,006	54.51	1,211,243	57.00
Net income.....	0	0	0	0	300,358	24.16	361,418	23.31	583,959	27.48
Cap. consump.....	0	0	0	0	482,533	38.82	528,413	34.09	669,589	31.51
Deferred tax.....	0	0	0	0	18,137	1.46	12,957	.84	26,284	1.24
Other oper.....	0	0	0	0	6,651	.54	-57,782	-3.73	-68,589	-3.23
Issues ltd.....	0	0	0	0	66,234	5.33	435,980	28.12	78,792	3.71
Issues stock.....	0	0	0	0	51,985	4.18	108,602	7.01	265,228	12.48
All other.....	0	0	0	0	268,226	21.58	160,641	10.36	569,794	26.81
Uses: All uses.....	0	0	0	0	1,243,012	100.00	1,550,229	100.00	2,125,057	100.00
Work. cap. inc.....	0	0	0	0	0	0	128,670	8.30	148,971	7.01
Dividends.....	0	0	0	0	164,150	13.21	120,266	7.76	127,808	6.01
Cap. expend.....	0	0	0	0	821,276	66.07	1,072,301	69.17	1,517,080	71.39
Investments.....	0	0	0	0	58,959	4.74	48,388	3.12	33,300	1.57
All other.....	0	0	0	0	198,627	15.98	180,604	11.65	297,898	14.02
<hr/>										
	1974		1975		1976		1977			
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
Sources: All sources.....	\$2,724,600	100.00	\$3,202,200	100.00	\$3,537,440	100.00	\$4,511,467	100.00		
Work. cap. dec.....	0	90.00	0	0	0	0	0	0	0	0
Operations.....	2,107,094	77.34	2,069,586	64.63	2,363,586	66.81	3,099,483	68.70		
Net income.....	1,202,733	44.14	1,022,208	31.92	1,171,317	33.11	1,427,552	31.64		
Cap. consump.....	755,923	27.74	883,262	27.58	975,473	27.58	1,228,422	27.23		
Deferred tax.....	29,430	1.08	167,490	5.23	172,113	4.87	453,445	10.05		
Other oper.....	119,008	4.37	-3,374	-.11	44,614	1.26	-9,936	-.22		
Issues ltd.....	179,187	6.58	288,380	9.01	707,344	20.00	332,262	7.36		
Issues stock.....	20,791	.76	196,438	6.13	103,151	3.06	697,013	15.45		
All other.....	417,528	15.32	647,796	20.23	358,428	10.13	382,709	8.48		
Uses: All uses.....	2,724,600	100.00	3,202,200	100.00	3,537,440	100.00	4,511,467	100.00		
Work. cap. inc.....	245,548	9.01	250,738	7.83	54,083	1.53	40,674	.90		
Dividends.....	165,367	6.07	257,446	8.04	279,223	7.89	361,701	8.02		
Cap. expend.....	1,942,473	71.29	2,377,492	74.25	2,605,673	73.66	3,338,195	73.99		
Investments.....	22,942	.84	-43,968	-1.37	168,551	4.76	45,879	1.02		
All other.....	348,270	12.78	360,492	11.26	429,910	12.15	725,018	16.07		



	1969		1970		1971		1972		1973	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
<b>NONOIL COMPANIES</b>										
Sources: All sources.....	0	0	0	0	\$44,074,833	100.00	\$43,207,817	100.00	\$55,582,510	100.00
Work. cap. dec.....	0	0	0	0	16,905	.04	067	0	954	0
Operations.....	0	0	0	0	33,290,510	75.53	39,067,401	81.04	46,563,734	83.77
Net income.....	0	0	0	0	17,863,312	40.53	22,344,530	46.35	27,771,671	49.96
Cap. consump.....	0	0	0	0	15,459,409	35.08	16,777,106	34.80	18,313,764	32.95
Deferred tax.....	0	0	0	0	684,689	1.55	887,786	1.84	1,262,001	2.27
Other oper.....	0	0	0	0	-716,900	-1.63	-942,021	-1.95	-783,702	-1.41
Issues ltd.....	0	0	0	0	4,686,552	10.63	3,209,774	6.66	3,716,545	6.69
Issues stock.....	0	0	0	0	2,150,592	4.88	1,489,484	3.09	264,130	.48
All other.....	0	0	0	0	3,947,180	8.96	4,441,158	9.21	5,038,101	9.06
Uses: All uses.....	0	0	0	0	44,074,833	100.00	43,207,817	100.00	55,582,510	100.00
Work. cap. inc.....	0	0	0	0	9,061,837	20.56	10,120,035	20.99	8,825,277	15.88
Dividends.....	0	0	0	0	8,909,936	20.22	9,549,573	19.81	10,418,894	18.74
Cap. expend.....	0	0	0	0	21,074,791	47.82	22,314,349	46.29	28,719,957	51.67
Investments.....	0	0	0	0	1,117,934	2.54	1,533,377	3.18	2,036,324	3.66
All other.....	0	0	0	0	3,910,335	8.87	4,690,483	9.73	5,582,059	10.04

	1974		1975		1976		1977	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
Sources: All sources.....	\$65,911,221	100.00	\$65,393,479	100.00	\$73,792,457	100.00	\$81,076,504	100.00
Work. cap. dec.....	10,775	.02	8,482	.01	22,877	.03	59,671	.07
Operations.....	47,710,742	72.39	49,807,178	76.17	61,453,044	83.28	69,042,573	85.16
Net income.....	27,347,890	41.49	27,561,797	42.15	37,137,137	50.33	41,993,669	51.80
Cap. consump.....	19,564,414	29.68	21,638,344	33.09	23,528,666	31.88	26,091,667	32.18
Deferred tax.....	1,257,412	1.91	2,041,620	3.12	2,239,349	3.03	2,213,724	2.73
Other oper.....	-1,024,973	-1.58	-1,434,582	-2.19	-1,452,107	-1.97	-1,256,486	-1.55
Issues ltd.....	10,343,034	15.69	7,124,836	10.90	1,174,658	1.59	4,365,162	5.38
Issues stock.....	1,117,580	1.70	2,606,777	3.99	3,223,567	4.37	-345,557	-.43
All other.....	6,739,866	10.23	5,854,689	8.95	7,941,188	10.76	8,014,326	9.88
Uses: All uses.....	65,911,221	100.00	65,393,479	100.00	73,792,457	100.00	81,076,504	100.00
Work. cap. inc.....	9,358,922	14.20	12,981,226	19.85	15,538,686	21.06	9,373,670	11.56
Dividends.....	11,059,581	16.77	11,257,515	17.22	13,685,286	18.55	16,617,310	20.50
Cap. expend.....	37,095,476	56.28	34,312,958	52.47	35,605,953	48.25	42,824,934	52.82
Investments.....	1,230,208	1.87	1,312,061	2.01	1,380,174	1.87	2,651,271	3.27
All other.....	7,170,935	10.88	5,529,721	8.46	7,582,359	10.28	9,609,319	11.85

See footnote at end of table.

TABLE XI.—SOURCE AND USES OF FUNDS, 1971-77—Continued  
 [Dollar amounts in millions]

	1969		1970		1971		1972		1973	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
<b>INTEGRATED PETROLEUM AND REFINING COMPANIES</b>										
Sources: All sources	0	0	0	0	\$17,134,395	100.00	\$17,109,423	100.00	\$23,186,472	100.00
Work. cap. dec	0	0	0	0	0	0	0	0	0	0
Operations	0	0	0	0	13,289,654	77.56	13,579,636	79.37	18,563,079	80.06
Net income	0	0	0	0	7,122,707	41.57	7,046,247	41.18	11,435,064	49.32
Cap. consump.	0	0	0	0	6,100,965	35.61	6,462,461	37.77	7,291,261	31.45
Deferred tax	0	0	0	0	344,051	2.01	6,425,170	2.49	801,303	3.46
Other oper.	0	0	0	0	-278,069	-1.62	-354,242	-2.07	-964,549	-4.16
Issues ltd.	0	0	0	0	2,350,358	13.72	997,901	5.83	473,244	2.04
Issues stock	0	0	0	0	-16,280	-0.10	150,133	.88	-549,171	-2.37
All other	0	0	0	0	1,510,663	8.82	2,381,753	13.92	4,699,320	20.27
Uses: All uses	0	0	0	0	17,134,395	100.00	17,109,423	100.00	23,196,472	100.00
Work. cap. inc.	0	0	0	0	999,582	5.83	582,758	3.41	4,628,146	19.96
Dividends	0	0	0	0	3,719,965	21.71	3,732,914	21.82	3,985,420	17.19
Cap. expend.	0	0	0	0	10,952,937	63.92	10,932,685	63.90	11,889,952	51.28
Investments	0	0	0	0	883,200	5.15	846,097	4.95	574,413	2.48
All other	0	0	0	0	578,711	3.38	1,014,969	5.93	2,108,541	9.09
	1974		1975		1976		1977			
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent		
Sources: All sources	\$36,343,181	100.00	\$29,909,307	100.00	\$33,449,211	100.00	\$33,915,560	100.00		
Work. cap. dec	0	0	816,766	2.83	0	0	0	0		
Operations	25,227,447	69.41	18,613,509	64.39	23,213,020	69.40	26,723,927	78.80		
Net income	15,937,205	43.85	11,423,845	39.52	13,380,961	40.00	14,275,446	42.09		
Cap. consump.	8,501,720	23.39	9,504,638	32.88	9,539,025	28.52	10,973,316	32.35		
Deferred tax	1,102,513	3.03	1,118,999	3.87	1,721,630	5.15	2,153,536	6.35		
Other oper.	-313,991	-0.86	-3,433,973	-11.88	-1,428,596	-4.27	-678,371	-2.00		
Issues ltd.	2,896,531	7.97	5,017,344	17.36	5,611,574	16.78	3,351,518	9.88		
Issues stock	288,163	.79	293,639	1.02	677,568	2.03	605,932	1.79		
All other	7,931,041	21.82	4,168,049	14.42	3,947,050	11.80	3,234,183	9.54		
Uses: All uses	36,343,181	100.00	29,909,307	100.00	33,449,211	100.00	33,915,560	100.00		
Work. cap. inc.	5,747,777	15.82	0	0	2,455,451	7.34	752,606	2.22		
Dividends	4,598,512	12.65	4,843,326	16.75	5,151,210	15.40	5,815,242	17.15		
Cap. expend.	19,420,103	53.44	20,949,962	72.47	22,351,207	66.82	24,552,899	72.39		
Investments	2,611,035	7.18	1,437,932	4.97	827,364	2.47	626,463	1.85		
All other	3,965,754	10.91	1,678,087	5.80	2,663,979	7.96	2,168,349	6.39		

Source: Standard & Poor's Corp. compustat file.

TABLE XII.—SELECTED PURCHASES BY PETROLEUM COMPANIES OF BUSINESSES NOT CLEARLY IDENTIFIED AS PETROCHEMICAL OR OTHER ENERGY EXAMPLES

Purchasing company	Purchased company	Date	Selected details
1. Mobil.....	Marcor.....	1974 forward..	1. 1973 purchased \$27,000,000 of stock. 2. 1974 bought: Common stock..... \$470,000,000 Preferred stock..... 135,000,000 Newly issued preferred..... 200,000,000 Total..... 805,000,000 Long-term debt: 1973..... \$1,087 1974..... 1,729 Increase..... 642 Notes and accounts payable: 1973..... \$349 1974..... 742 Increase..... 393 3. 1976 purchased remainder: (a) issued \$673,000,000 of debentures to owners; (b) used \$107,000,000 of Mobil stock.
2. Arco.....	(a) The Observer (British newspaper). (b) Anaconda (copper, aluminum) <sup>1</sup> .	1976..... 1976 forward..	No details. 1. 1976 cash of \$167,000,000 for 27 percent of stock. 2. 1977 issued \$420,000,000 of common stock and \$97,000,000 cash in merger.
3. Gulf.....	Reston, Ocean Village, Venture Out in America.	Recent years..	
4. Sun.....	Kewanee (petrochemical). 1. St. Johnsburg Trucking Co. 2. H. P. International..... 3. Audio Magnetics..... 4. Stop-N-Go Foods..... 5. Kar Products..... 6. Becton, Dickinson and Co. 7. Atlas Screw & Specialty. 8. Weiland Computer Group.	1977..... 1975..... 1975..... 1976..... 1976..... 1977..... 1978 (medical supply). 1978..... 1978.....	\$455,000,000. \$20,000,000 cash. Exchange of undisclosed shares. Refinancing and equity investment. Exchange of shares. Purchase of shares. \$293,000,000 of cash and notes. \$3,600,000. Purchase of stock.
5. Standard Oil California.....	21 percent of Amax.....	1975.....	1. Cash \$170,000,000. 2. Exchange of preferred stock and ultimate repurchase of company stock from Amax in January 1976. 3. Purchase of 500,000 shares in open market.
6. Union.....		1974.....	Acquired 3 rock crushing plants in southern California.
7. Quaker State.....	Jamestown Design & Machine Corp.	1974.....	Exchange for 10,328 Treasury shares.
8. Ashland.....	Polk Material..... Angelo Tomasso..... Mac's Super Glass..... Harrison Inc..... Franklin Stone..... Star Construction..... Reno Construction..... Mac's Super Glass (auto polishes and related products). Seaboard Construction..... Livingston Ship Building Co. Hodges & Co..... Nielsons.....	1971..... 1971..... 1972..... 1972 <sup>a</sup> ..... 1972 <sup>a</sup> ..... 1972 <sup>a</sup> ..... 1972..... 1972..... 1973..... 1975..... 1976..... 1977.....	20,000 common shares. 520,000 shares. 63,024 common shares. 132,089 common shares. 320,000 common shares. 63,024 common shares. 65,000 common shares. Exchange of shares; 802,632 were issued. 38,500 shares. 655,000 common shares.
9. Tesoro.....	Arnold Pipe Rental..... Charles Wheatly Co. (producer of petroleum values) VFI Inc..... Eagle Transport Co..... Turner Drill Pipe.....	1970..... 1972..... 1973..... 1974..... 1974.....	104,530 shares and \$212,000 payable in stock and cash. 220,000 shares. 40,000 common shares. Cash and provisional note equals \$700,000,000.
10. Pennzoil.....	W. S. Ranch.....	1973.....	
PENDING			
11. Mobil.....	Badcow (forest products, liner board, oil and gas).		Preferred stock of \$475,000,000 (represents a portion of authorized but not issued stock).
12. Sun.....	Metrodata Computing (INC's computing division).		\$3,000,000—Merger, amount undisclosed.
13. Occidental Corporation.....	Meade Corp.....		
14. Standard Oil (Indiana).....	Cypress Mines.....		

<sup>1</sup> Copper being divested under recent agreement with the Federal Trade Commission order.<sup>2</sup> Asphalt paving.

Source: Moody's and annual reports.

TABLE XIII.—DISPOSITION OF NET INCREASE IN OIL RECEIPTS

[Dollar amounts in billions]

	Calendar year—				Total 1979-81	Total 1979-82
	1979	1980	1981	1982		
<b>Base case—No increase in real OPEC price:</b>						
Net increase in oil receipts.....	\$1.0	\$5.0	\$9.3	\$10.9	\$15.4	\$26.3
Net increase in after-tax producer and royalty income:						
Without windfall profits tax.....	\$0.5	\$2.6	\$4.9	\$5.7	\$8.0	\$13.7
With windfall profits tax.....	\$0.5	\$2.1	\$3.4	\$3.9	\$6.0	\$9.9
Percent reduction due to windfall profits tax.....		18.4	31.3	30.8	25.1	27.4
Gross windfall profits tax.....		\$0.8	\$2.5	\$2.8	\$3.2	\$6.0
Net windfall profits tax (after reduction in Federal income taxes).....		\$0.5	\$1.5	\$1.7	\$2.0	\$3.8
<b>Alternate case—3-percent increase in real OPEC price:</b>						
Net increase in oil receipts.....	\$0.1	\$5.3	\$10.7	\$13.7	\$17.0	\$30.7
Net increase in after-tax producer and royalty income:						
Without windfall profits tax.....	\$0.5	\$2.5	\$5.0	\$6.3	\$8.1	\$14.4
With windfall profits tax.....	\$0.5	\$1.9	\$2.9	\$3.5	\$5.4	\$8.8
Percent reduction due to windfall profits tax.....		23.5	42.0	45.4	33.5	38.7
Gross windfall profits tax.....		\$1.0	\$3.4	\$4.7	\$4.3	\$9.0
Net windfall profits tax (after reduction in Federal income taxes).....		\$0.6	\$2.1	\$2.9	\$2.7	\$5.6

Source: Office of the Secretary of the Treasury, Office of Tax Analysis.

TABLE XIV.—SUMMARY OF ADDITIONAL OIL RECEIPTS AND TAXES UNDER DECONTROL AND THE WINDFALL PROFITS TAX ASSUMING NO OPEC REAL INCREASE IN PRICES

[In millions of dollars]

	Calendar years—						
	1979	1980	1981	1982	1983	1984	1985
<b>Decontrol:</b>							
Gross increase in oil receipts.....	1,208	5,797	11,503	14,488	15,119	17,657	20,375
Less deductible costs of induced production.....	-167	-751	-2,170	-3,625	-4,687	-7,366	-10,156
Net increase in oil receipts.....	1,041	5,046	9,333	10,863	10,432	10,291	10,219
Less depletion and State and local severances and income taxes.....	-134	-644	-1,158	-1,308	-1,218	-1,184	-1,176
Increase in Federal taxable income.....	907	4,402	8,175	9,555	9,214	9,107	9,043
Federal marginal income tax rate.....	.45	.45	.45	.45	.45	.45	.45
Increase in Federal income tax before windfall profits tax.....	408	1,981	3,679	4,300	4,146	4,098	4,070
<b>Windfall profits tax:</b>							
Gross windfall profits tax.....		766	2,457	2,815	2,022	1,752	1,510
Net change in Federal taxable income.....		-638	-2,062	-2,384	-1,729	-1,502	-1,296
Federal marginal income tax rate.....	.45	.45	.45	.45	.45	.45	.45
Reduction in Federal income tax for windfall profits tax.....		-287	-928	-1,073	-778	-676	-583
<b>Disposition of net increase in oil receipts:</b>							
Private sector.....	520	2,116	3,357	3,922	4,110	4,176	4,266
State and local government.....	92	369	583	682	721	735	752
Federal Government (includes Federal royalties).....	429	2,561	5,393	6,259	5,601	5,380	5,201
Total, net increase.....	1,041	5,046	9,333	10,863	10,432	10,291	10,219
<b>Addenda:</b>							
Effective Federal tax rate:							
On gross increase in oil receipts.....	.34	.42	.45	.42	.36	.29	.25
On net increase in oil receipts.....	.39	.49	.56	.56	.52	.50	.49
Effective Federal income tax rate before windfall profits tax:							
On gross increase in oil receipts.....	.34	.34	.32	.30	.27	.23	.20
On net increase in oil receipts.....	.39	.39	.39	.40	.40	.40	.40

Source: Office of the Secretary of the Treasury, Office of Tax Analysis.

Senator GRAVEL. Thank you very much, Mr. Sunley. That is a very excellent, documented paper.

Our next witness is Mr. Richard M. Smith, Department of Energy.

**STATEMENT OF RICHARD M. SMITH, DIRECTOR, OFFICE OF POLICY COORDINATION, OFFICE OF POLICY AND EVALUATION, DEPARTMENT OF ENERGY**

Mr. SMITH. Thank you, Mr. Chairman.

I am pleased to appear here today before you to discuss briefly the Department of Energy's perspective on financial issues regarding the oil and gas industry and the significance of these issues to future exploration and development.

Assembling a complete picture of the capital requirements, profitability, and motivating financial elements of the oil and gas production industry is a complex task. Mr. Sunley, of the Department of Treasury, has provided a very complete and excellent description of the historical financial indices for the oil and gas industry. As Mr. Sunley points out, the financial data for the industry as a whole is difficult to relate directly to oil and gas exploration and development because of the wide range of activities of the integrated firms and the inability precisely to disaggregate such factors as profitability, debt-equity ratios, and cost of capital.

Fortunately, however, the historical record of direct expenditures for oil and gas exploration and development is documented by the Department of Commerce, annual survey of oil and gas, and the industry-sponsored joint association survey. Those cost and expenditure data, along with projected levels of production and the revenues that will be received therefrom, can be extrapolated into the future with reasonable confidence levels. That data supports projections of revenues, exploration and development expenditures, tax consequences, and net cash flow positions for that segment of the industry that is engaged in conventional oil and gas exploration, development and production.

To be sure, projections of the future in this area must be allowed a range of variability to cover uncertainties. But, the uncertainty is focused upon the discrete production-related activities of the industry rather than on difficulties in precisely disaggregating total industry financial data.

The Department of Energy and several other groups and institutions, over the past 2 years, have analyzed this data and made projections of the capital requirements of the petroleum production industry for the next several years—typically through 1985.

There is unanimous agreement from these studies that the future capital requirements of the domestic oil and gas industries will be great—on the order of \$200 billion—1979 dollars—or more through 1985. There are diverse opinions, however, regarding the precise magnitude of these requirements, the role that cash flow will play in determining the level of exploration and development, the methods by which new projects will be financed, and the ability of the industry to obtain necessary capital.

In an endeavor to reconcile or explain these various conclusions regarding capital needs and capital sources of the petroleum industry,

DOE in mid-1978 commissioned a study by ICF, Inc. hereafter referred to as the ICF study, to analyze and compare the administration's estimates for the first national energy plan with the conclusions contained in six major analyses by persons outside the Federal Government.

That study is in the process of being completed and has not been evaluated within the Department of Energy at this time. Currently, three volumes are bound in final draft form.

Volume 1, the executive summary, and volume 5, the pro forma financial projections are in preliminary draft form. However, I will discuss the general conclusions of the draft report and briefly relate those conclusions to the President's crude oil pricing program.

The recent private studies that were evaluated in the ICF study were performed by the Chase Manhattan Bank, Standard Oil Co., of Ohio, the Council of Energy Resources of the University of Texas, Bankers Trust Co., C. H. Keplinger, and the Independent Producers Association of America. Each of these studies was developed with different frames of reference and with different objectives.

The table on page 4 illustrates the wide range of opinion of how much drilling the industry will do over the next 7 or 8 years and what is projected as to what the expenditures are and as to the total reserves that will be added during this period.

These diverse results suggest fundamental differences in assumptions regarding the factors that influence capital expenditures by the oil and gas industry. For example, the Chase study assumed that each barrel of production should be replaced by a barrel of reserves and that the industry would drill enough wells to reach that target. The IPAA study assumed a production target sufficient to reduce projected oil imports to a given level.

Neither study indicated how the industry could drill 2.8 or 2.9 billion feet of profitable prospects in 8 or 9 years, which would require drilling 50-percent higher than the very high 1978 level. Sohio used the NEP 1985 projected production as a base, but held constant the reserve to production ratio, which significantly increased reserve addition "requirements." The low productivity assumed in the CERUT model coupled with the CERUT-perceived inadequacy of the NEP prices led to a projection of less drilling and fewer reserves added.

[The following was subsequently supplied for the record:]

	Average annual productivity (BOE/ft) <sup>1</sup>	Cumulative drilling footage (including dry holes; millions of feet)	Projected E. & O. expenditures (billions of 1979 dollars) total	Total reserves added (billions of BOE)
DOE (1978-85).....	24.0	1,930	\$205	50.7
Chase (1978-85).....	19.6	2,823	317	55.3
IPAA (1977-85).....	-----	2,943	314	58.2
SOHIO (1977-85).....	-----	2,401	241	63.4
CERUT (NEP Case) (1977-85).....	15.0	1,800	223	29.9

<sup>1</sup> Barrels of oil equivalent of reserves of oil, natural gas, and natural gas liquids added per year divided by total drilling footage in the year.

Note: The Bankers Trust and Keplinger studies cannot—be directly related to this format. Bankers Trust covered only the years 1978 to 1982. Keplinger estimated a finding cost per barrel but did not make an econometric analyses of industry expenditures.

Mr. SMITH. In the final analysis, it would appear that the most important factor in determining the future investment levels of the oil and gas industry is the extent, quality, and accessibility of the remaining oil and natural gas resource base. At any given level of oil prices, there is a finite number of projects that can be developed and produced profitably by the industry. The oil and gas industry is not basically eleemosynary in nature nor is it organized merely to drill holes in the Earth.

It cannot be expected that the industry will blindly invest in exploration and drilling when anticipated profit cannot be projected to meet acceptable levels, regardless of the extent of available cash flow to fund such activity. Therefore, it is essential that a realistic assessment of future drilling prospects underlie a projection of cash flow requirements and E. & D. investment activities of the industry.

For these reasons, the administration's original NEP analysis, the ICF study, and current DOE analyses are founded upon U.S. Geological Survey resource base estimates and assume that expected rate of return from new oil and gas projects is the critical determinant of the level of future capital investment in domestic oil and gas production.

The DOE/EIA midterm oil and gas supply model projects domestic oil and natural gas production from analysis of geological, economic, and engineering factors which affect oil and gas supply.

The DOE/EIA oil and gas model has three major interconnected submodels. First, a drilling submodel develops information about the economic gradations of the resource base. The extent of the resource base is defined principally by the U.S. Geological Survey circular No. 725, a 1975 estimate of remaining recoverable reserves of oil and gas.

Second, a resource submodel translates exploratory drilling, the prospects for finding oil, the intensity of development, the fraction of oil-in-place which can be recovered by either primary, secondary, or tertiary methods, and the fraction of proved reserves which can be produced each year into annual production quantities by region. Third, an economic submodel calculates a minimum acceptable price for each year's quantity of reserves proved.

A hypothetical project, either exploratory or developmental, is included in the DOE forecast of production in a future year only if the minimum acceptable price is less than or equal to the expected future market price. Through this process of projecting drilling activity and production, an estimate of industry capital requirements can be developed.

The most significant variables in the DOE assessment of future capital requirements are:

Quality and accessibility of the resource base.

Productivity, finding rate of BOE/feet drilled.

Drilling costs per foot drilled.

Lease acquisition costs.

Required rate of return on investment—discount rate.

I will discuss these variables briefly.

#### ACCESSIBILITY OF THE RESOURCE BASE

The DOE Model currently uses the 1975 USGS circular 725 to estimate the remaining resource base. If the USGS estimate is too pessimistic, there may be a greater number of profitable drilling

opportunities at any given productivity or price level and therefore projected E. & D. expenditures would be higher. However, circular 725 is generally regarded as falling within a reasonable range.

The DOE model also uses the current DOI OCS leasing schedule of four to five sales per year to estimate accessibility of the resource. The President has directed that additional acreage be added to the current OCS leasing schedule. If Federal OCS lease sales are accelerated, for example, to six or seven per year, and if NPR-A is opened for private leasing and development, the accessible portion of the resource base would increase significantly.

It is not likely, however, that these actions would greatly affect industry E. & D. expenditure before the mid-1980's because of the long lead times required to develop new areas. In any event, DOE foresees no capital constraints that would prevent the oil and gas industry from responding to an accelerated leasing schedule.

#### PRODUCTIVITY

Productivity, or finding rate per foot drilled, is a most significant factor in the cost of finding and producing crude oil or natural gas.

Since 1973, there has been a strong upturn in oil and drilling activity in the United States. See appendix A. The number of active rotary drilling rigs has doubled and total drilling footage has increased by 50 percent. See appendix B. Despite the increase in drilling, the rate of additions to the oil and gas reserves per foot drilled has trended sharply downward. The finding rate of oil and gas per foot drilled has declined from a high of 53 BOE/feet in 1967 to a low of 18 BOE/feet in 1977 and 16 BOE/feet in 1978. See appendix C.

Reasons for the rate of decline are difficult to substantiate at this time. Two possible theories have been advanced and were analyzed by the ICF study.

There has been more intensive development of existing fields to enhance production and the industry is developing previously bypassed lower quality deposits with lower productivity in response to the sharp price rises in 1973 and 1974.

There has been a permanent transition to a lower quality plateau in the resource base.

The first theory supports a view that, in due course, overall productivity will increase as industry returns to a higher degree of exploratory drilling. Exploratory drilling historically has yielded significantly higher productivity and has not declined as substantially as has overall productivity in recent years. See appendix B.

The DOE/EIA model derives productivity projections from regression analysis of 20 years of data, which minimizes the impact of the sharp downturn in recent years. As a result, the DOE/EIA model projects an average productivity of 24 BOE/feet from 1978 to 1985, which, of course, is considerably higher than actual experience in the past few years. If the first theory regarding the recent productivity downturn, which is the more plausible, is the more accurate, the DOE/EIA estimate will in the long run prove to be basically valid.

Nevertheless, consequences of lower future productivity upon industry investment requirements must be considered. It has been argued that if productivity is, in fact, lower than DOE projects, the industry will be required to make even greater expenditures for exploration and



development in the future. The argument presupposes that the industry has specific production targets and will drill to whatever extent and at whatever cost is necessary to achieve that level of production.

In fact, however, the industry responds principally to prospective marginal returns on investment and lower productivity could merely mean lower E. & D. expenditures, higher cash flow, and lower future production. The industry cannot reasonably be expected to invest more capital in drilling projects which are, overall, less financially attractive.

On the other hand, to the extent that industry views cash flow as lower cost capital than new debt or equity, it is conceivable that increased cash flow would moderately support a maintenance of E. & D. expenditure levels in the face of lower productivity.

#### DRILLING COSTS

The DOE/EIA model assumes that drilling costs per foot will remain constant in real terms over time but overall unit drilling costs will increase as the average depth of wells increases to recover deep hydrocarbon deposits. Drilling costs constitute approximately 50 percent of E. & D. expenditures and errors in projection of the per foot cost would have significant effects on overall costs. However, like lower productivity, higher drilling costs would tend to make new investments less profitable and should not result in an overall increase in exploration and development expenditures.

#### LEASE ACQUISITION EXPENDITURES

Industry lease acquisition expenditures have fluctuated widely in recent years. The amount in any given year has reflected in large measure the amount and quality of Federal Outer Continental Shelf acreage leased in that year.

Another important factor in determining the amount of lease acquisition expenditures is the expected revenue from the lease. A company will not bid more for a lease than it can expect to recover from production. Thus, while lease acquisition—or bonus payment—costs are deducted from industry revenues to determine cash flow, it is important to note that they are totally variable in response to an assessment by the industry of future prices of oil and gas and quality of the prospect. Lease acquisition expenditures distribute a share of the economic “rents” to the landowner—principally the U.S. Government—but they do not significantly affect long-run profitability of the industry unless the industry becomes particularly inept at estimating these prospects.

#### REQUIRED RETURN ON INVESTMENT

The DOE/EIA model assumes that the minimum required discounted cash-flow return on investment for oil and gas E. & D. is 8 percent real after tax—15 to 18 percent nominal at current inflation rates. If a lower DCF return is acceptable to the industry, E. & D. requirements would be projected to increase since there would be a larger selection of profitable projects in the resource base. The ICF study projects that a 6-percent return requirement would increase

E. & D. expenditures by a total of \$23 billion—a 12-percent increase—from 1978 to 1985, compared with an 8-percent discount rate.

The basic conclusion that can be drawn from the ICF study is that the oil and gas industry will have adequate cash flow through 1985 to finance projected exploration and development expenditures. I have included a sample pro forma financial sheet for the industry from the ICF study to illustrate the process. See appendix E.

That chart and the ICF study do not take into account such factors as the latest increase in world oil prices, or the President's program for decontrol. The ICF analysis was based upon world oil prices that we are seeing now and are likely to see in the future.

The higher world oil prices of course, will be predicted to increase the exploration and development expenditures of the industry. At the same time, they would increase cash flow by a considerable amount as well.

Also, the crude oil pricing provisions in the President's program will increase revenues and cash flow to the industry somewhat above the levels assumed in the ICF study. We looked only at cash flow and estimated that increased cash flow to the industry was on the order of \$2.5 billion a year through 1980 and after 1985.

There have been, and I am sure there will be, suggestions that the oil and gas industry will need significantly higher revenues to undertake an aggressive campaign. We believe that such contentions are contradicted by sound investment theory and by the conclusions that can be drawn from the ICF study.

In conclusion, it is important to stress that the returns on future investment are the basic determinant of industry capital expenditures. If, in the remote event that cash flow from the oil and gas industry in existing and future production is not adequate for investment, future returns will lure new entrants to the industry and increased competition. As further cash flow increases from existing oil will not.

Thank you, Mr. Chairman, for this opportunity to appear before the committee. I would be pleased to answer any questions.

Senator GRAVEL. Thank you very much.

Miss Rivlin.

#### **STATEMENT OF ALICE RIVLIN, DIRECTOR, CONGRESSIONAL BUDGET OFFICE**

Ms. RIVLIN. Thank you, Mr. Chairman.

I am pleased to appear before this subcommittee to discuss some aspects of the administration's proposals for the phased decontrol of domestic oil and a windfall profits tax. The Congressional Budget Office recently completed a preliminary study of the energy and economic effects of the administration's plan and is now preparing a more comprehensive analysis.

In general, our preliminary conclusions are quite similar to those of the administration in terms of the oil import reductions and increased inflation likely to result from the plan. In my remarks, today I will discuss three issues that I believe are important to the tax and revenue aspects of the administration's proposals:

1. The potential producer revenues and tax receipts that the proposals would generate.

2. The nature of the incentives for accelerated oil exploration and development.

3. The pros and cons of creating an Energy Security Fund.

#### THE POTENTIAL PRODUCER REVENUES AND TAX RECEIPTS

CBO estimates that, between June 1, 1979, and September 30, 1981, the proposal for phased decontrol would generate about \$14 billion in current dollars in increased wellhead oil revenues, as compared with a continuation of the present system of controls. From October 1, 1981, through the end of 1985, decontrol would increase revenues by another \$49 billion. If the revenues generated by new supply are included, producer revenues would increase about \$62 billion for this period.

If enacted by the Congress, the administration's proposal for a windfall profits tax—which is essentially an excise tax—would return about \$4.2 billion of the increased revenues to the Treasury by September 30, 1981, on an accrual basis.

Through the end of 1985, the windfall profits tax would generate an additional \$17.3 billion. After deducting the windfall tax and an assumed 7 percent of the gross increase in revenues for State and local taxes, including severance taxes, about \$9 billion would be subject to Federal income taxes through the third quarter of 1981. Through the end of 1985, an additional \$28 billion would be subject to Federal income taxes.

The estimated amount of Federal income taxes to be paid on these increased profits is a controversial issue. The portion of the \$9 billion that would actually be paid in taxes on an accrual basis by the end of 1981 is likely to be very small—probably less than 20 percent. The reason for this is straightforward. If the producers reinvest a large portion of these revenues in oil drilling and exploration the investment in the initial period would result in large tax write-offs for drilling expenses, rapid depreciation of capital equipment, and Federal tax credits for part of the initial investment.

In all likelihood, very little newly discovered oil would flow in this period, and therefore there would be no increase in revenues and thus in taxable income during this early period.

In subsequent years, however, as the discoveries from the exploration and development expenditures result in oil production, the tax liability of the companies would grow. How much tax revenues would actually result depends on a variety of factors, including the success of new drilling, the amount of production still shielded by the remaining oil depletion allowances, future investment expenditures by the companies, and so forth.

The Treasury Department has assumed that, over the long term, after deducting windfall and State taxes, the oil producers would pay 40 percent of the remaining increased revenues resulting from decontrol in Federal taxes. We believe this is an overestimate.

Reports filed with the Securities and Exchange Commission and annual reports for crude oil producers and integrated companies suggest that, since 1975 when the percentage depletion allowance was eliminated for large producers, these companies have accrued between 34 and 36 percent of their net operating revenues in taxes of all forms.

Subtracting 7 percent for State and local taxes leaves about 28 percent of the net operating revenues paid as Federal income taxes. Thus, 28 percent represents the long-run income tax rate for producers, as revenues from new production increase, unless drilling expenditures continue to accelerate.

Treasury tables are not entirely clear on this. I am informed by Mr. Sunley that the 40 percent might well apply to a smaller base after deduction of additional costs, so their estimate may not be that different from our 28. Perhaps Mr. Sunley can enlighten us on this fact at the end of my testimony.

Over the long run, the combination of the proposed windfall tax, the State and local taxes, and the corporate income tax—with CBO's assumed 28-percent corporate income tax rate—would result in about 55 percent of the increased revenues being paid in taxes, leaving 45 percent with the producers. The role of the windfall profits tax is key. Without it, the Government, including State and local governments, would collect only about 30 percent of the increased revenues in taxes.

#### INCENTIVES FOR EXPLORATION AND DEVELOPMENT

Are the incentives proposed by the administration adequate to promote an acceleration of oil exploration and development over the next few years? Most economists view this question in terms of the prices allowed for new oil production. If the price of oil is high enough, rational investors will undertake the investment required for production. All the investment funds need not come from oil companies' internal cash flow, they argue, for the high price will be enough to attract the necessary capital, through borrowing.

Viewed in this context, the incentives proposed by the President to encourage new oil exploration and development are most certainly adequate. For truly new oil, the producers would be allowed the world price, currently over \$16 per barrel. For marginal wells and other old oil, which may require additional investment to increase production, the administration would more than double the allowed price, from \$6 to about \$13 per barrel over the next 6 months. For tertiary recovery, the marginal revenue to the producers would actually exceed the world price, since producers undertaking tertiary projects would also be allowed more rapid decontrol for already flowing oil production. It appears, therefore, that in terms of price incentives, the administration's proposals would be adequate to encourage a significant amount of new investment.

Some producers, along with segments of the banking community, have argued that, because oil exploration and development is relatively risky investment, it is difficult to obtain external financing and internally generated funds are a necessity.

Therefore, they reason, without the additional cash flow, the required investment for exploration and development will not occur. Recent studies, however, tend to contradict the view that cash flow determines the level of investment in petroleum exploration. One study, for example, which examined both major oil companies and independents, found only a weak relationship between internal cash flow and investment in exploration and development. Also, this study found evidence of considerable borrowing by both major oil producers and independents for exploration and development. While we believe

that the price of oil is the critical factor in determining investment in exploration and development, it may be helpful to consider the additional cash flow that would be generated by the administration's proposals and compare this with potential for new drilling.

Although there has been a slight decline in drilling activity in the past 3 to 4 months, in 1978 there was more oil drilling in the United States than any other year in the past two decades. Although complete data are not yet available, total expenditures for exploration and development may well have exceeded \$19 billion in 1978, as compared with \$16.3 billion in 1977. It appears that significant expansion is possible for future drilling and exploration.

On the basis of industry-supplied data, which includes rapid construction of new rigs and equipment in the next few years, we estimate that drilling rates might be expanded by a maximum of 25 to 30 percent by 1981 over last year's levels. The key constraint to even more rapid expansion is the limited number of available drilling rigs. In dollar terms, after allowing for inflation in drilling costs, CBO estimates that total expenditures for oil exploration and development might rise to as much as \$25 billion to \$27 billion by 1981.

How, then, does the increase in cash flow generated by the administration's pricing and taxing proposals compare with the funds that the industry could productively use for drilling in the next few years? Projections of this sort are necessarily speculative because of increases in drilling costs and other factors, but based on our analysis, a minimum of \$6 to \$7 billion in new after-tax cash flow would accrue to the industry under the administration's plan over the 1979-80 period.

Depending on the amount and type of new investment that takes place, the potential cash flow during this period could be even somewhat higher. In the post-1979-81 period, of course, the revenues will rise considerably. We estimate that this increased cash flow would finance at least two-thirds and possibly all of the maximum additional exploration and development that could occur between now and 1981.

Consequently, even if one accepts the view that cash flow determines investment in exploration and development—which we do not—the additional revenues to the oil industry are more than adequate to provide for maximum drilling and exploration over the next several years. Lack of drilling equipment appears to be the major limiting factor.

#### THE PROS AND CONS OF AN ENERGY TRUST FUND

The administration has proposed that the Congress establish an energy security trust fund to redistribute the tax revenues both to low-income households to soften the burden of higher oil prices and to mass transit and energy research and development to foster the transition to a more energy-efficient economy.

Although such a trust fund has the advantage of providing a mechanism to assist low-income households in offsetting higher energy prices, it has some disadvantages from budgetary and policy coordination standpoints.

First, trust funds, with their long-term earmarking of funds, limit budgetary control since they are only marginally affected by budget resolutions and the appropriations process. Second, since both energy investments and mass transit currently have relatively large Federal programs, additional expenditures from a trust fund would create

some coordination problems for the Congress in their authorization and appropriation processes and for the executive agencies in the administration of these programs.

Further, if OPEC prices did not increase in real terms, the revenue flow into this fund would decrease over time and would, in fact, drop off sharply by the mid-1980's when old and new oil were exhausted. Such a phaseout of the funding source might cause problems in managing these programs, particularly those for energy investments which are long-term capital projects.

On the other hand, if there is a large OPEC increase, there may be large amounts in the trust fund.

Mr. Chairman, I would be happy to respond to any questions that you might have.

Senator GRAVEL. Thank you very much.

Taking the data from a couple of charts, I notice the figure used for industry would be about \$200 billion by 1985 as the low-end figure. Then it goes on to \$300 billion.

From a macro point of view, industry needs between \$200 and \$300 billion by 1985 as capital required to perform its function in our society. Can you unravel from the various tables how much would be coming historically from cash flow and how much historically would be coming from external sources? If there is a deficit, what would be the size of that deficit, and how is it to be made up, leaving aside the deregulation.

Mr. SMITH. Mr. Chairman.

Senator GRAVEL. Let's use \$250 billion as a round figure.

Mr. SMITH. If the total E. & D. expenditure requirements were \$250 billion, if you look at appendix C, gross cash flow less the dividends results in a net cash flow projection in 1979 dollars of a total of \$220,416 million.

If one were to assume that the capital requirements were in excess of that \$220 billion, then the excess obviously would come from external sources.

We would think, although certainly we do not have a crystal ball in this regard, that it would be reasonably well divided between debt and equity. The industry is not a static industry in debt or equity senses. They are constantly raising capital with both mechanisms.

I would point out, however, if one were to assume that the "requirements" were \$250 billion, the DOE model, in effect, it would reduce the level of drilling because of the fact that it would not project \$250 billion worth of profitable endeavors. But if in fact the requirement were \$250 billion, in this sense, there would be a possible deficit of \$30 billion. We would see absolutely no difficulty in the industry's raising that. They have raised on the order of \$7 to \$8 billion average over the last 5 years from external sources and could be expected to do so in the future.

Senator GRAVEL. What you are saying is that they could raise \$230 out of cash flow?

Mr. SMITH. \$220 would be our projection.

Senator GRAVEL. \$220 billion.

So if we take just the average I was talking about, they would have to raise \$30 billion through external sources. And from your figures they have a track record of raising funds from other sources.

Mr. SUNLEY. Mr. Chairman, I refer you to the table on page 19

of my statement showing information on the capital outlays of the industry as a percent of cash flow and as a percent of the total sources of funds. This shows that the total oil and gas extraction industry, in fact, has made capital outlays in excess of 100 percent of their cash flow every year except 1974 when cash flow was obviously inflated by the OPEC price increases in January of that year.

I think this is what you would expect from an industry that has good prospects. They are able to raise external funds. In fact, you will find that their investments will exceed their cash flow.

This has occurred in the oil and gas industry now for a number of years. I think we can expect that to continue in the future. They will be able to go to capital markets.

Senator GRAVEL. You made a statement earlier that their ability to finance externally is based, of course, on the anticipation of profits. If there is no commensurate increase in OPEC prices then that will impair their ability to finance externally. Is that right?

Mr. SUNLEY. I think the \$16 price provides a very adequate, very strong incentive to make investments. I am certain that an oil producer investing in the United States gets to keep after taxes more than an oil producer investing in any other country in the world.

We have tremendous incentives to make these investments for the future at this time.

Senator GRAVEL. I thought I saw on the chart that it was more profitable for any company abroad than domestically. How can you make the statement they are keeping more domestically than from their foreign operations?

Mr. SUNLEY. You are referring to one of the charts in my testimony?

Senator GRAVEL. Yes.

Mr. SUNLEY. I indicated that 80 percent of their sales come from foreign sources. I did not indicate that the amount that they keep per barrel is more abroad than at home; it is not.

Senator GRAVEL. Are you saying that the profitability of the industry is higher domestically than it is in foreign markets?

Mr. SUNLEY. To some extent while lifting costs are probably somewhat higher in the United States and transportation costs generally lower, the foreign government "take" is extremely high.

Senator GRAVEL. Netting it out?

Mr. SUNLEY. The tax payments to the Government are substantially less in the United States than you would find around the Persian Gulf.

Senator GRAVEL. Which would mean that it is more profitable to produce energy abroad and sell it abroad than it would be domestically.

Mr. SUNLEY. No; I believe that I said that the tax payments per barrel of oil are higher around the Persian Gulf than is the case in the United States.

Senator LONG. Could I ask a question at this point? How many barrels of oil does an average Persian Gulf well produce?

Mr. SMITH. In the hundreds. I do not have a number.

Senator LONG. In Saudi Arabia, it is 5,000 barrels. That is my impression. What is it in Kuwait?

Mr. SMITH. I do not have that.

Senator LONG. It seems to me if you make a comparison, saying the tax treatment is better for an American who is investing money

in oil here than it is in Kuwait or Saudi Arabia, you just might as well be talking about the temperature 50 miles away from the Sun or 10 miles away from the Moon, or something like that—20 miles away from all tourists.

It does not have any relevance to anything.

Are you under the impression that Saudi Arabia or Kuwait gives the United States money to drill those wells?

Mr. SUNLEY. No; I am not suggesting that.

Senator LONG. My impression is they do not know what to do with all of our money, they have so much of it. I do not know why you want to talk about something that has no relevance to anything whatever.

It seems to me what we ought to be talking about is whether we provide enough incentive to make America energy self-sufficient. Maybe nobody at this table is interested in doing that.

I recall President Nixon wanted to do that. What is the goal of the administration? Are you hoping to have energy independence or to be at the mercy of OPEC forever?

Mr. SUNLEY. The major goal, Mr. Chairman, of the administration is to reduce our dependence on foreign oil.

Senator LONG. Energy dependent forever?

Mr. SUNLEY. No; let me repeat: Reduce significantly our dependence on foreign energy. I think the President's program of decontrol, by getting oil prices up, will affect the consumption of oil in our country, will provide increased incentives to find oil in our country, will hold down our imports of oil and be a major significant factor in stimulating production of alternate energy resources.

Senator LONG. That did not answer the question I had in mind. It seems to me you could answer it. In other words, President Nixon, rightly or wrongly, when confronted with what I believe to be the bankruptcy of a disastrous policy, the policy of depending on the world market for our oil and the successful, effective operation of the OPEC cartel, he said that we must have energy independence in the United States.

That policy was vetoed, largely by the more liberal members of the Democratic Party.

I just want to know if that line of thought still holds in this administration. Do you have any plans to have energy independence? If so, when?

Mr. SUNLEY. Do you mean by that, Mr. Chairman, no importing of oil at all?

Senator LONG. I mean the capability of producing it all right here, yes.

Mr. SUNLEY. No; I do not believe that is a realistic prospect.

Senator LONG. You see, in my opinion, President Nixon was right. He had people in the industry down there and said, how long will it take to restore energy independence?

They said 7 years. He said, OK, if you think we can do it in 7 years, we will give it first priority and we will restore energy independence in 7 years.

At that time, the Democratic caucus met and appointed a committee to go see what could be done. They came up with this plan which I regarded as being a plan for energy dependence forever.



I take it that is the plan you are up here supporting now? We will never, ever be an independent country again, as far as energy is concerned, if we follow your guidelines here; is that not correct?

Mr. SUNLEY. I would anticipate in the future we will be importing some of our energy. I think that we can greatly reduce our dependence on foreign oil supplies. To my knowledge, there is no private economist who foresees a future, under any set of policies, that would have us import no foreign oil.

Senator LONG. I hope President Carter gets himself reelected. I hope that he is able to demonstrate the achievements of his administration.

Projecting what you are advocating here now—say in September or October next year, when the President is out campaigning, how much better or worse will the situation be than it was before the President took office in terms of what we are paying for oil from foreign countries.

Mr. SMITH. Mr. Chairman, if I might, it would be much higher. We have had an increase—

Senator LONG. There ought to be some good news you could get out. Maybe you could say “adjusted for inflation” or “compared to the gross national product.”

You know, President Eisenhower used to do that once in a while in his early years. They would say, “Good news. Unemployment did not increase as much this month as it increased last month. The rate of unemployment is not going up as fast as it was going up.”

Maybe you can make a good news announcement to the effect we are buying a lot more oil in dollars than we did before? Will you say we are buying less in terms of barrels?

Mr. SMITH. No, sir. Probably more in terms of barrels. But we did have the good fortune of bringing on the Alaska North Slope production since the President was elected—I realize he cannot take credit for that.

Senator GRAVEL. I would just like to correct the record.

Senator LONG. I think Senator Gravel says, “Where did you get that ‘we’ stuff.” Senator Gravel offered a floor amendment that just absolutely had the committee leadership gnashing its teeth, saying here is an environmental impact study, and he stacked it on top of his desk and he said, rather than going on 10 to 15 years arguing about environment, I am offering this amendment for Congress to put its stamp of approval on this environmental impact study so we can proceed and there will not be any more environmental issues left to argue about.

Senator Jackson said, if that were agreed to, it would just wreck the whole thing, nothing could be accomplished and we would be wasting our time in even passing the bill. It was agreed to; the result was the fight over the environment came to an end. The courts up there got the message in the Gravel amendment. The pipeline is there.

We would still be in court, still fighting about the caribou, if it were not for the Gravel amendment. I think when you say “we did this,” where did you get that “we” stuff?

I cannot recall that those who support your position had anything to do with that Gravel amendment. My impression is they were gravely concerned that it was going to adversely affect the migration

of the caribou and I believe that when they constructed the pipeline they put parts of it up high and parts of it down low—

Senator GRAVEL. So the caribou could pass.

Senator Long. As I understand it, the caribou are crossing the pipeline, but not at the place where they built it especially for the caribou to cross.

Senator GRAVEL. Yes. If you will yield at that point?

May I quote, on page 8, the President has directed that certain acreage be added. I have no evidence of that except what will take place in December. I do know on December 1 last year the President of the United States, by a stroke of the pen, withdrew from the national inventory effectively 40 million acres of sedimentary basin.

The administration has done that with the use of the Antiquities Act. Then last week the administration rallied the environmental community to press for legislation in the Congress to lock up around 126 million acres of land, probably impacting 100 million acres of sedimentary basin. I cannot see where the administration really is acting aggressively in the marketplace for the possibility of sedimentary basins.

Would you care to comment on that?

Mr. SMITH. Last year it was an interim measure until the Congress—

Senator GRAVEL. Let me correct you. It is not an interim measure. They said it was an interim measure; that is rhetoric. It is permanent, unless the Congress ever changes it. We have had something similar that happened in Wyoming that is still permanent. The President himself cannot revoke it.

So the 56 million acres that he took includes about 10 million acres in the Yukon Flats sedimentary basin, which has had only one hole drilled in it. His action also effects the blockage of the entire North Slope, other than Prudhoe Bay and other immediately adjacent areas, which accounts for another 30 million acres of sedimentary basin.

So the record is very clear that 40 million acres of sedimentary basin have been blocked. Prudhoe Bay in Alaska, involving only 190,000 acres of land, contains a third of the oil and gas reserves in the United States today. 190,000 acres. Yet by the stroke of a pen, the President took out of inventory 40 million acres of sedimentary basin.

Mr. SMITH. Yes, sir, but I understand that Congress did not complete work on the bill that would deal with it by law last year.

Senator GRAVEL. The Congress is going to be more helpful. We are talking about legislation that is stocking 126 million acres. That probably will pass the House this week. The fact that Congress may make an error does not absolve the administration from the error it already made.

How do you speak to the point that I raised? In this period when we are trying to get capital, trying to get a place to use the capital, trying to provide sedimentary basins, how do you reconcile the posture of the administration?

We will let the Congress reconcile its own posture with what it is going to do in the House.

Mr. SMITH. The philosophy of the administration is basically in support of balance between energy and environmental concerns. I recognize these are extremely controversial issues, and the balance can be stricken at different points by different persons.

But I believe that the President's program in regard to accelerated OCS leasing and private development in the NPRA, while it will not occur immediately, will have substantial impact on oil and gas production in the mid-1980's and beyond.

Senator GRAVEL. May I correct you on NPRA? If the President's actions stand and if the Congress abates those actions, there will not be any way to get the oil out. Therefore, it will be most difficult to get the private sector to go drill in NPRA, since there is no way to get it out. You would have to cross a wilderness area and a national park to do it.

That is exactly what we anticipate the legislation will preclude in the House and under the Antiquities Act.

Mr. SMITH. I am not familiar with that. Of course, the TAPS line itself could be expanded.

Senator GRAVEL. The line, if as we hope oil is found in the Beaufort Sea, could be expanded to 2 million barrels a day. But I am talking about the NPRA which is what you are talking about, and that line will not service that area.

Mr. SMITH. Not by itself, certainly. It might in conjunction with other lines. You are correct. There are issues.

Senator GRAVEL. You could find two, three, four pools of 1 billion barrels each, and it could be uneconomic to get it out.

Mr. SMITH. That is, of course, one of the great problems in the frontier areas generally, the expense of removing the oil once it is discovered.

Senator GRAVEL. Let me say that it was not my intent to embarrass you, sir, but to make the record abundantly clear about the schizophrenia of this administration, at least in my State, in energy.

Senator LONG. The thought that occurs to me, is how can we reduce our dependence on foreign oil.

If you are going to solve the problem, you ought to have enough drilling equipment. You ought to have enough mining equipment to enable us to become energy independent.

We have been saddled with this mess for 6 years. I honestly believe if we had followed the priorities set by President Nixon in 1973, and given them time to work, we would be energy independent today. We are not going to achieve energy independence if we do not try.

I find it very difficult to think we are going to get out of this trap by doing anything other than the kind of thing that Americans have done in times of urgency when they have felt that they have to do something. My thought would have been that you should have doubled the activity, doubled it again, doubled it again, up to the point that you found a way to solve your problem.

Finding cheaper and more effective—atomic energy seems to be on the back shelf for some time to come.

The policies pursued by this Government, some over my protest, put more than 50 percent of the independent oil and gas people out of business prior to the Arab boycott. They had rigs stacked up, just rusting at the time the Arab boycott came. Higher prices on new oil did put many of those oil rigs back to work. Those were old rigs. They could not get down deep. They were not efficient for drilling to below 10,000 feet.

The new rigs that have been developed go down to 15,000 feet and below 15,000 feet to produce new oil. What about them?

Mr. SMITH. Mr. Chairman, I do not have a number on the percentage of rigs in relation to depth. I can supply that for the record. It is something that is available.

[The following was subsequently supplied for the record:]

TOTAL ROTARY RIGS AVAILABLE<sup>1</sup>

Rig depth (feet)	1974	1975	1976	1977	1978
3,000 to 5,000.....	387	396	468	542	557
Percent.....	(20)	(20)	(21)	(22)	(20)
6,000 to 9,000.....	529	579	633	628	723
Percent.....	(28)	(29)	(29)	(25)	(25)
1,000 to 12,000.....	339	380	366	461	565
Percent.....	(18)	(19)	(17)	(19)	(20)
13,000 to 15,000.....	214	225	239	274	313
Percent.....	(11)	(11)	(11)	(11)	(11)
16,000 plus.....	425	448	498	577	693
Percent.....	(22)	(22)	(23)	(23)	(24)
Total.....	1,894	2,028	2,204	2,482	2,851

<sup>1</sup> Date taken from "Annual Rotary Rig Census", Drilling-D.C.W.

Mr. SMITH. There has been, of course, a substantial increase in the number of rigs active, from down about 1,000 in the early 1970's. It has gone up to around 2,000 at the moment.

I think the oil companies project on the side of 2,600 by the end of the year.

More and more of those rigs are coming on line and are capable of drilling at depths of 10,000 and 15,000 feet.

Senator LONG. The last figures I saw indicated we are getting between 200 and 300 new rigs a year. It seems to me we should be getting 1,000 new rigs a year.

How many are we producing now? How many new rigs are we getting?

Mr. SMITH. I think the 200 to 300 is the range. I think the industry has stated it has the capacity to produce up to 600 or 700 a year.

The rig producing industry has the capacity, but the people who buy the rigs determine what the demand is. We believe, of course, as Mr. Sunley points out, that the President's program will provide a high level of incentives for new oil production and will therefore result in a further increase in the number of active rigs, new rigs of all different types.

In regard to the deep drilling rigs, I think also the fact that the Natural Gas Policy Act will deregulate gas below 15,000 feet as of the end of this year will serve as additional substantial incentive for that kind of activity.

Senator LONG. In Louisiana, if you want a lease within the 3-mile boundary, you suggest you would like to bid on it and nominate a particular area for leasing and advertise it. That usually takes a couple of months to advertise.

Then, bids are accepted. Usually at the bid opening, bids are accepted for the areas where there are substantial offers. The successful bidders then apply for and receive a permit about the same day the bid is accepted. In short order, the successful bidder is drilling away.

Given 90 days, if something is there, the driller would find it or he would keep right on drilling until he did.

Within a year, he would have the well completed and have the oil and the gas flowing into the pipeline. When you move out beyond that

3-mile boundary to see what the Federal Government does, you find it takes about 6 years to get permits, do the drilling, and start producing something that goes in the pipeline.

What progress is being made to reduce that 6 years to something more like 1 year that is required in Louisiana?

What is the timelag from the time you apply for a lease on the Continental Shelf and you get that oil or gas in a pipeline to move to its destination?

Mr. SMITH. In general, we would agree with your facts—5, 6, or 7 years, in some of the more remote Outer Continental Shelf areas from the date of leasing to the date of full production.

But from the date of nomination, so to speak, when it is determined that that area will be leased, I do not know precisely. I think it is on the order of 3 to 4 years in addition or the 5 or 6.

Senator LONG. It may be 9 or 10 years, from what you are saying.

Mr. SMITH. Certainly there are substantial leadtimes as we move farther and farther offshore.

Senator LONG. That would not sound as though much urgency is being put on the development of energy out there.

Mr. SMITH. The Outer Continental Shelf Lands Act was enacted last year and the Department of Interior could better provide the detail on this. I believe the effect of that was to somewhat expedite the leasing process.

Senator LONG. There may be some aspects of that Act that will justify this, but I swear some of the suggestions that have been made are pretty ridiculous.

I guess they have finally given up on it but for awhile people at the Interior Department were trying to require that the water taken out of the ocean to cool equipment would have to be purer when it went in the ocean than it was when it came out of the ocean. I was not under the impression that we were building \$2 billion pipe forms out there the purpose of which was a water purification program, salt water to fresh water. I thought we were there to get energy.

A great deal of that stuff has been patently ridiculous, involving tremendous applications of funds for things that are really not very necessary. I think Senator Gravel would know a lot more about it than I do, but a great deal of what was done on the environmental aspects of the Alaskan pipeline ran up the cost to 5 or 10 times what it was supposed to cost.

A lot of that was really not necessary.

Senator GRAVEL. I estimate about \$2 billion more. What is interesting is what the Congress did after that cost overrun on the oil line, Congress turned around and passed a law that required the Government to set the variable rate of equitable return on the gas line. This is now one of the impediments in getting the gas line built, and which was occasioned by the Government itself, and admitted to.

The Senator from Wyoming, Senator Wallop.

Senator WALLOP. Thank you, Mr. Chairman.

I have several questions I would like to submit for the record later.

Two things that really trouble me, Mr. Sunley and Ms. Rivlin, both of you have identified this tax not as an excess profits tax but as an excise tax. Reading it, I cannot disagree with that.

My question to you is, is it not possible that someone would be paying that tax even though he were not making a profit of any kind?

Mr. SUNLEY. Senator Wallop, that is possible if the oil is being produced and sold at controlled prices without profit. The tax, however, is deductible for Federal income tax purposes.

We should be aware of the considerable difficulties of developing a true excess profits tax. We have had experience with such taxes.

Senator WALLOP. That was my next question, then. How, when somebody gathers oil from a collection point, are we not going to remain in the regulation business because of the difficulty of trying to identify all of those different years when the oil was found and what its actual price should have been compared to the price that is allowed before you get into taxes?

Are you not really putting an enormous regulatory burden on yourself and retaining a regulatory burden on the industry?

Mr. SUNLEY. Part of the regulatory burden of controls does continue as a part of the tax. However, the whole entitlement program is wiped out, so we eliminate the complexities of shifting money around.

Senator WALLOP. Maintaining employment in the regulatory industry?

Mr. SUNLEY. By no means, sir.

When we have phased out the upper tier portion of the tax, all oil will be subject to the windfall profits tax, with the same base price, with the exception of Alaskan North Slope oil that is excluded from the tax.

It is pretty easy to identify that. It does not get confused with other oil.

It is true that until you completely phase out the lower tier and the upper tiers you do carry over some of the regulatory problems of controls.

Senator WALLOP. Let me ask you this. If this should happen on June 1 that prices will establish at the level they should have been had the escalation been permitted, provided by law and continued on that trend until October 1, 1981, in accordance with the law, would producers derive approximately \$12 billion of revenue above that which they would receive if present price trends continued?

Mr. SMITH. Yes.

Senator WALLOP. The \$12 billion, plus the \$5 billion already denied producers because they did not release that last year either, to allow the escalation, the total \$17 billion compared with the \$6.5 billion you now say is going to producers as a result of deregulation means, in fact, they are still going to receive approximately \$10.5 billion less than they were led to believe by the Congress and administration when EPCA was adopted.

Mr. SMITH. Well—

Senator WALLOP. I guess the subsequent question is, can you characterize that as windfall?

Mr. SMITH. Under the act, the administration clearly was invested with discretion with regard to the amount of price increases. You are correct. You can take the theoretical composite price and compare it with the revenues that are being earned at this particular moment. Not taking into account the President's program, there is about a \$5 billion gap. That was due principally to the reduction in inflation adjustments during a period when the industry had overrun the collections that they were entitled to.

You are correct. There is roughly a \$5 billion gap between what theoretically would be permitted. There is wide disagreement on what industry should expect, or did expect, from that.

Senator WALLOP. Would you not agree that it was the intent of everybody, certainly the belief that people were operating under, that EPCA authorized price increases would continue? Granted, there is discretion. Certainly it was the intent that that discretion would be judiciously used and not deny this as an option.

Mr. SMITH. Clearly, the rate of increase in oil prices has been substantially higher than inflation. The administration had to take that into account in determining what level of prices would be permitted. The increases come about because old oil has disappeared at a much more rapid rate than was originally contemplated.

Arguably, the \$5 billion is more than an adequate reserve. But, the administration basically believes that we should start from this point forward and provide the proper incentives for new oil production.

We do not believe that the \$5 billion should be recompensed in any sense and therefore it should not be taken into account when projecting what the producers will receive under the President's program.

Senator WALLOP. Let me conclude by saying that I certainly hope that the statements that you make are not a reflection of administration thinking, that there is no realistic way to achieve independence. For that to go out as the posture of the Government of this country when we have oil, oil shale, tar sands, coal—we have energy resources in this country coming out of our ears that we are not using. And for us to say that there is no way that we could achieve true independence, it just has to be a discouraging thought to the American people.

Senator LONG. I think it is fair to make this statement, Senator. I believe it is safe to say that we are the only enlightened Nation on Earth that has so much to work with and has done so little work with it.

Mr. SUNLEY. If I may respond, Senator Wallop, I think it is clear that this administration, as did the previous administrations, wanted to achieve energy independence in the sense that we were not over the barrel with respect to those countries surrounding the Persian Gulf. I do not think that implied that we would not import some of our energy needs.

It is true, we want to be in a posture where if there were a new oil embargo, the whole economy does not shut down. But I think, in that sense, we are protected.

But I do not believe even the previous administrations, either the Nixon or the Ford administration, envisioned a world where we would import no oil.

Senator WALLOP. I think that they envisioned a world in which we would not have to import under certain circumstances.

When we are trying to encourage a little bit of production and a little conservation, the President promised the world, the consumers of oil, that we would consume 5 percent less in the world market than we did last year.

If we had just burnt as much coal last year as we did the year before, that 5-percent goal would have been achieved.

In a country that is going short of energy, for us to go in a decline of consumption and production of coal because we have so much of it and fiddle around with windfall taxes and try to tell people that the \$5 billion they otherwise would have gotten under EPCA is no longer available to them, that it is all a part of a windfall, it seems to me that there is no course on which this country is launched, this administration or any other one. They do not seem to be tracking a course of independence. They seem, indeed, to be doing the opposite—a course of increasing dependence.

Mr. SUNLEY. Mr. Wallop, if I may respond, the President has taken the very important first step of decontrolling.

Senator WALLOP. I agree.

Mr. SUNLEY. It has several important benefits. By releasing the old oil, it gives increased incentive for enhanced recovery necessary to maintain production in the older fields, possibly increase the production for some. I think we are providing a higher price for new oil and incremental tertiary.

You should not lose sight of the very important effects of the President's program to decontrol and providing increased incentives to produce and, at the same time, getting the price paid by American consumers and industry that use oil up to world price levels.

Senator WALLOP. By your own testimony, we are at \$5 billion less of incentives than if it had followed its course—\$5 billion less. Then we are terming that windfall. That is what is distressing.

Thank you, Mr. Chairman.

Senator GRAVEL. I will try to measure what that \$5 billion means. I am not satisfied with the macroapproach or the answers you gave. Let us try to reconstruct this, if we can.

I am using the appendix, table 11. I am not sure, reading those figures in Mr. Sunley's table, of the source and use of funds from 1971 through 1977 for oil and gas extraction.

What I am trying to get at, also in Mr. Smith's charts on page, are the various models, the Sohio, Chase, and so on.

Are these projected E. & D. expenditures holding? What historically has been done, or is this a projection?

Of course, historically what has been done was producing a decline, an increase in our dependence. So if we want to increase our independence, maybe we will not get to 100 percent, but maybe we can go from 50 percent to 20 percent or 25 percent, and thereby cut it in half.

How much money is going to be required to do that? How much incentive are we providing to do that?

If what we are talking about is treading water, then that obviously is inadequate, based on the last 5 years' performance. I am trying to decipher this from the figures that you have thrown at us. I might add that you have thrown quite a bit and they seem well organized.

Let us recapitulate. What do our energy needs require right now, per year, in total capital? What additional capital are we going to have to provide incentive to improve upon that performance of production based upon the existing capital getting into it?

Could we try to deal with that macroproblem?

Mr. SMITH. Well, in terms of the capital required to substantially reduce oil imports, I think that the most fundamental thing that could happen to further reduce oil imports by 1985, 1990, and perhaps



in the best of situations, eliminate them entirely by the year 2000 would be a substantial increase in real world oil prices.

While we certainly do not advocate that—it would be counter-productive in general economic terms—the thing that is going to motivate industry to produce higher levels of conventional oil and gas, or for the industry to produce shale oil, higher levels of coal, are the economic incentives that are going to be driven by the world oil price.

If, indeed, the world oil price does rise, the capital requirements of the industry for conventional oil and gas will increase. As I pointed out in my testimony, the cash flow that the industry will derive from its existing production will substantially increase and eventually counterbalance that.

The ICF study I referred to did some sensitivity analyses as to world oil prices, and concluded the cash flow increases would be commensurate with the increased capital needs from the higher world oil prices.

But I do not feel, as a practical matter, that the administration can foresee the ability of the Nation to be entirely free of imports of petroleum in the year 2000 at current world oil prices.

Senator GRAVEL. If we take what you are saying at face value, then it does not square with the present policy of a windfall profits tax. The same rhetoric can be used if there is a 20-percent increase in world prices next year. Then you would say there is a windfall over what happened this year, so let's take it away.

If your statement is correct, there is really no need for a windfall tax, because that is exactly the device we are using to jet money into the energy area to produce more energy. But if you call it a windfall and must tax it away, you are denying the capital you are talking about.

You are still not responding to my question. How much money did we expend in the United States in the search for oil and gas?

Mr. SMITH. For oil and gas, I think Miss Rivlin's figure is essentially the same as ours, around \$20 billion in exploration and development.

Senator GRAVEL. \$20 billion is what we expended last year.

Mr. SMITH. Yes, sir.

Senator GRAVEL. What do you project is going to be required by the energy industry this year?

Mr. SMITH. Our estimate in 1979 dollars is approximately \$24 billion.

Senator GRAVEL. They are going to have \$24 billion this year. That is with your excess profits tax?

Mr. SMITH. This is \$24 billion not taking account of the President's program. With the President's program there will be, perhaps, some slight additional capital needs—above the level projected in the ICF report—but the major impact of the President's program will be to increase cash flow—not to increase, in the short run E. & D. expenditures.

Senator GRAVEL. No increase at all next year?

Mr. SMITH. Some modest increase for additional tertiary recovery and what have you.

As Mr. Sunley pointed out, the administration's program does contemplate a major portion of the capital for tertiary recovery projects to be generated by old oil, free of the windfall taxes, profit tax.

Senator GRAVEL. How much do you think the windfall profits tax will take next year? How much will they get next year from industry; just next year?

Mr. SUNLEY. \$500 million.

May I add to what Mr. Smith said? Let us tie in to what Miss Rivlin said earlier. If you look at the last appendix table in my testimony, you will see our estimates of the additional oil receipts and taxes under decontrol, and the windfall profits tax. The first row in the table shows the gross increase in oil receipts.

Senator GRAVEL. Where?

Mr. SUNLEY. Appendix table 14, the very last in the prepared statement.

The first row in that appendix table shows the gross increase in oil receipts resulting from decontrol, and the second row shows the deductible cost of induced production.

As I said in my testimony, our estimates do assume that decontrol will induce additional production. It does affect the amount of enhanced recovery and the amount of new drilling.

You will notice, however, in 1979 and 1980, the deductible cost of the induced production is a fairly small fraction of the gross national increase in oil receipts.

If you take 1980, the gross increase in oil receipts is \$5.8 billion. Induced production is \$800 million. By the time you get down to 1985, the increased drilling associated with decontrol is \$10 billion of deductible costs out of the \$20 billion out of gross receipts.

It has a substantial impact, we believe, and we believe that 17 percent of our domestic production then will be as a result of the production induced by measures being proposed.

Senator GRAVEL. Would you explain what induced production is?

Mr. SUNLEY. Because of the higher prices which will be permitted owners of old oil properties and also owners of new oil properties, it will induce them to make additional investments in enhanced recovery, secondary or tertiary or new drilling on the new properties.

We do believe decontrol will have a significant impact on the production of oil. Also, it will have an impact on the production of alternative energy sources.

In Miss Rivlin's testimony, she criticized the Treasury marginal tax rate of 40 percent and suggested that the tax rate might be as low as 28 percent. I think this depends a little bit on whether you are comparing the increase in Federal income taxes to the gross oil receipts before any of this induced production, in which case, our last two rows of the table show a decline in that marginal tax rate from 34 percent to 20 percent in the period 1979 to 1985.

However, if you are comparing the Federal tax rates on the net receipts after the additional drilling expenses and the cost of the enhanced recovery, then the marginal tax rate would be 40 percent. It differs from 46 percent primarily because of the deductibility of State and local severance taxes, ad valorem taxes and State income taxes.

There has been some misunderstanding in the press of the marginal tax rate we have been talking about and what it is being applied to, and I think there is confusion which spilled over into Miss Rivlin's statement.

When we are comparing the same numbers, I think we do not have a fundamental disagreement in terms of what the tax rate is.

I think it is very important to examine this table, because it does demonstrate the size of the production impact which we are estimating as a result of the higher prices which the decontrol, coupled with the President's windfall profits tax, will induce.

Senator GRAVEL. Thank you.

I would like to yield to Senator Durenberger.

Senator DURENBERGER. I wonder, you missed the question which was very simply stated, or I missed the answer. Can you answer the chairman's original question, which was measured in dollars, what are the capital needs, either year by year to the year 2000 or every 5 years, to make the oil and gas industry of the country domestically self-sufficient, or is it in the table?

Mr. SMITH. Appendix E of my testimony illustrates through 1985. We have not, for this purpose, attempted to take it beyond 1985, although one would expect we would continue at constant levels.

Senator GRAVEL. Appendix E?

Mr. SMITH. Appendix E.

Through 1985, \$204 billion; 1978 to 1985. If you exclude 1978, that already has occurred, obviously; the total would be on the order of \$180 billion.

We projected E. & D. capital needs under constant old oil prices, and without the President's program. As I indicate, with the President's program or with rising oil prices then both the capital requirements of the industry would be projected to increase to levels higher than are illustrated here. But those cost increases would be essentially offset in terms of the net capital needs of the industry, by the increases in cash flow that would come out as a result of increases in oil prices.

So that we believe, with a reasonable degree of confidence, one can project through 1985 that whatever happens to world oil prices that the cash flow position of the industry is going to be adequate to meet the exploration and development expenditure requirements.

Senator GRAVEL. If the Senator would yield, what you are saying is meet the requirements? The requirements for what? A declining line and a greater foreign dependency. That is what the present requirements are. We are trying to alter those requirements.

Suppose, rather than this \$204 billion, we spent \$408 billion. What do you project will be our foreign dependency if we double our capital?

Mr. SMITH. If it were assumed that the industry would double its expenditures, it would be expected that the 1985 production estimate would be on the order of 30 to 40 percent higher than what we project, and we would have a very significantly lesser dependence on foreign imports.

But I think the basic point that my testimony tries to make, the basic position of the administration, and I think of the other witnesses who appeared before you today, is that the industry is going to be able to raise the capital that it needs in relation to the price of petroleum that it foresees. And if the price goes up, the capital requirements go up, and so does cash flow. And these move along essentially in step, and there is no reason to foresee that the oil and gas industry and the conventional production aspect of its operations will be short of capital under the President's program with the windfall profits tax.

Senator LONG. It seems to me what you are saying here is under your program, the industry can raise enough money to stay at the mercy

of the Arabs as long as you expect to be in government, which may not be very long.

At one time, we had a plan which I thought made some sense. I admit some of the free traders did not like it. We put an amendment on a bill here in committee that said, because of national defense requirements, we will try to maintain our ability to produce our requirements of an essential item. It was clear that energy was an essential item under the terms of that amendment, and everybody understood what that meant.

At one point, the President pretty well agreed that fair administration of that would have us producing about 87 percent of our annual requirements and we would be importing the other 13 percent. Those are rough figures; they may be off somewhat.

So the free traders did not like it. They said we could buy it cheaper from the Arabs and, yes, we could. So they managed to get first one little loophole, then another to that law. Before they managed to do all of that, we were hit with the boycott at the time of the Suez crisis and the boycott did not work. All the United States did was open up its wells, just turn on the valves, turn on the pumps. Not only were we able to take care of the United States, we were able to fill in the shortfall for the whole world.

So the boycott did not work. Of course, then the free traders had their way and got us more and more dependent on foreign energy supplies. They said the boycott could not be made to work. So they had a chance to prove their point.

If you look at what we have faced since that time, I submit that any careful study would indicate that it would have been a great deal cheaper to have maintained the energy-producing capacity of this Nation. Did it ever occur to you that you people are flirting with the survival of freedom in this Nation and on this planet with the kind of policy you are pursuing that leaves us at the mercy of the Arabs and the Middle East, which is a very uncertain source of energy?

Does it occur to you that you have put the Congress in the position to put the squeeze on the energy supplies of the whole free world and to twist until it is no longer a free world? Has that occurred to you?

Mr. SUNLEY. Mr. Chairman, I really must disagree with that statement. It is quite clear that the President, by decontrolling, is doing essentially what you think should be done. The real fundamental issue, then, it seems to me, between you and the administration relates to what happens if the OPEC nations substantially increase, possibly quadruple oil prices.

Again, do we want those increased producer revenues to go to the producers as a windfall or do we want to say that revenues from those kinds of OPEC price increases, more rapid than our inflation rate, should be shared by the American people? I think that is the fundamental issue over the windfall profits tax.

Are we prepared to decontrol our oil prices so that the price received by our producers is determined by a cartel totally unrelated to competitive market forces? To ask the American consumer to pay that price to domestic producers, whatever the OPEC cartel says? and to permit all that increased revenue, all that increased rent, to go to producers and royalty holders? or should some of it go to the Government to help finance those kinds of energy projects which we think are important, such as the development of shale oil or otherwise.

**Senator LONG.** Let us compare this mess today, this continuing mess in energy, to what happened in sugar. There was a crop failure in Europe. Bad weather killed off the sugar beets so the world price for sugar went sky high, above 60 cents a pound. If this Nation had not been so busy with the energy problem, we undoubtedly could have done something about sugar, but it was too busy working on energy, so the sugar price went way up and people made a lot of money. What did they do with the money? Did they put it right back in the same business they were in? All the people in that business who had some money bought new equipment, cleared some new land, planted new sugar and so did everybody else around the world, so the next year the price went back down to what was a very reasonable price. The next year the surplus was so great it went down to a ridiculously cheap price, so sugar producers had to come in and beg the Government to save their industry from being wiped out.

We have a big surplus of sugar. We could export sugar—we are not exporting sugar, but if we had to do it, we sure could expand and export it, because we have the potential.

I am inclined to think if the Government had not been so busy looking after the energy problem instead of the sugar problem, we would have had an excess of energy. The Government rolled back the price, doubled the tax rate, and wound the industry up in so much redtape it could not move. That is basically what the Government program has been.

It would seem to me that the first order of business should be, if you ever want to solve the problem—and one wonders if this administration, or anybody around here has the capability to do it—but if you want to solve it, the first order of business should be to make it more profitable to produce energy than it is to produce anything else. Also energy should be given a priority above some of these rather strange things that we have seen in other respects.

In the main, I am thinking of some of the environmental restrictions that have been proposed. The Secretary of Energy goes with the Secretary of the Interior to talk to the President. They have a confrontation in the oval office. What do you reckon happens? The Secretary of Energy gets whipped. The next time the Secretary of Energy has another confrontation. I assume there will be another victory for the Secretary of the Interior.

What monument do they have up there in Alaska that we have made sacred now by declaring this area to be a national monument?

**Senator GRAVEL.** Fifty-six million acres, 10 million sedimentary basin, another 30 million which is blocked from possible use.

**Senator LONG.** What is the historical monument you have up there?

**Senator GRAVEL.** The reason for the Antiquities Act is for historic and scientific values. I think any reasonable person examining this cannot find 56 million acres of historic and scientific value.

**Senator LONG.** I thought there was an Indian totem pole up there. That is kind of thing one has to wonder about when you say where are our priorities. Why do we not put energy production at the top of the list? We have to recognize that if we lose our freedom, other nations will lose theirs. If we fail to provide leadership, if we project an image around the world that we are a big, fat glutton, who will not do anything to control his appetite or go to work or make sacrifices to solve the problem, we will have failed the entire free world.

Can you tell us that under your program the energy industry is going to be more profitable than any other industry?

Mr. SUNLEY. In my testimony we reviewed the profitability figures of the oil industry in recent years. We have seen a substantial rise in their profitability, their rate of return on equity or their rate of return on total assets.

It is true, as I pointed out in my joint testimony earlier, Mr. Chairman, that that rise in profitability began from a very low base.

There are a lot of problems with that statistically. Nevertheless, the rates of return earned by oil companies are essentially the same as that being earned by other industries.

Senator LONG. You say from a low base. At the time the Arabs put the boycott on, our starting point was half the domestic producers had been put out of business and the other half was going out of business. I hope we are not going to use that as the base from which to start.

If you want to become energy independent you need to make it more profitable to produce energy in the United States than to do anything else you might be considering putting your money into.

That is the way to attract more capital. You cannot borrow the money to finance risky energy exploration projects, if it is more profitable to go into other industries.

I guess you know, that, it is not regarded as good banking practice to loan money for a wildcat well, a discovery well. I guess you know that, do you not?

Mr. SUNLEY. The oil industry corporations—

Senator LONG. My understanding is that it is not a bankable loan to loan money to drill wildcat wells.

Mr. SUNLEY. I believe that is essentially correct, Mr. Long. The oil industry has other types of financing arrangements and overriding royalties, et cetera, which often take on the aspect of debt.

I agree, though, in general, you do not get bank loans to finance a wildcat well.

Senator LONG. You have your chart here. You make an important point, Mr. Smith, that the amount of energy you get for a foot drilled is declining. That is because you have to drill deeper; that is the main reason.

Mr. SMITH. And smaller reservoirs.

Senator LONG. That is the recent experience. Drilling has to go deeper. Is that not right?

Mr. SMITH. Part deeper, part declining quality of resource base on a continual curve, part of it more developmental drilling in recent years.

Senator LONG. You see, you have enough energy in fossil fuel to last you at least 300 years. We have to apply the capital to the resources. If we apply the capital to the resources we may be able to meet all our energy needs with fossil fuels alone.

It may be desirable to use more solar or more geothermal energy and all kinds of things later on. But, for the foreseeable future, given what we know at this moment, the thing to do is to apply existing technology and the money we have to our resources, and there is the answer.

If that much money will not do it, then you ought to put more.

Mr. SMITH. The money has to be put on the front end in a place where the industry can expect to receive it in terms of a return on its investment.

As I indicated, rising oil prices over the past few years have contributed to a greater level of exploration and development in the industry; no question about that. The shale oil tax credit the administration has proposed would subsidize shale oil production for a period of time, answering some serious environmental and economic questions.

Senator LONG. Let me ask you this. In writing this policy, was any effort made by the President or by someone close to the President, or the Secretary of Treasury, to get the producers of oil and gas and coal, and say, how long would it take you people to give us energy independence? What would it take to do it?

Was that done?

Mr. SMITH. To my knowledge, no, sir, but I think the answer from the industry has been continuously in the past several years, decontrol of oil and gas, and it is precisely what the President has proposed to do.

Senator LONG. They have not advocated this particular tax, have they?

Senator GRAVEL. No. In fact, one company said, keep the controls on; keep the taxes off.

Senator LONG. Has this ever been submitted to the industry, here is what we are thinking about doing; we would like to have your comments? Was that done?

Mr. SUNLEY. Mr. Chairman, there were a number of meetings between administration officials and the industry, both the representatives of the large, integrated oil companies and the independents, several separate meetings. Since then, there has been considerable consultation at the staff level over a lot of the basic underlying data which we presented in our testimony.

I would say that the industry has had a number of opportunities to come in and talk to the administration before the President's speech on April 5 and again during the period after his speech and during the period when technical details of the windfall profits tax were made available to Congress.

Senator LONG. My impression was that both the major companies and independents indicated they wanted to discuss this program, and they were not heard, that there was no meeting to discuss it. Is that right or wrong?

Mr. SUNLEY. I am afraid I do not know their counsel to the President. I do know of the meetings I sat in. There were substantial meetings with high administration officials discussing this program with the President.

Senator GRAVEL. Senator Dole.

Senator DOLE. The President has criticized energy companies for buying nonenergy assets—like a well-known department store. The President's proposal allows oil companies to retain, as I understand, with no strings attached, a portion of the decontrol revenues. Are they going to be permitted to use this new money to acquire a non-energy asset, to go out and buy a golf course or a department store?

Mr. SUNLEY. We would hope that is not what they would use the money for.

Senator DOLE. Is there anything that indicates the money will not be used in this fashion. The President in every public denunciation of the oil industry has cited this example as one of the horror stories.

Mr. SUNLEY. The President has not recommended tying the conditional after-tax income which the oil industry will receive from decontrol and the windfall profits tax to the way the money might be used.

Senator DOLE. The industry could use the revenue to buy a department store. They could use it to explore for energy outside the United States. Any prohibition on that?

Mr. SUNLEY. In the President's program, there was not a prohibition on that. I think that would be an interference with the market system; to tie each dollar in in that sort of way would be very undesirable.

Senator DOLE. There must be some reason for saying the industry has been doing these things. Maybe it is just a hope they will not acquire anything but energy assets.

You would not favor a system that would require the new money be spent for energy?

Mr. SUNLEY. I would like the money to be spent for energy sources, but I would not want to require it. You provide more incentive for an industry if you do not require the additional funds be used for particular purposes.

Senator DOLE. Is this the reason for the opposition to the so-called plowback provision?

Mr. SUNLEY. Essentially. If I may respond to that, there are two possibilities if you have a plowback type of provision. First, you have the plowback, a set of qualified expenditures that you can make and therefore reduce your windfall tax liability. If qualified expenditures are defined broadly, every producer will be making sufficient expenditures to eliminate his windfall profits tax; to do something like that is essentially to make the tax a sham.

Senator DOLE. Is it a windfall profits tax, or an excise tax?

Mr. SUNLEY. It is an excise tax designed to catch the windfall profits that will accrue to the industry as a result of decontrol. It is not technically a profits tax, and it is not based on a measure of the rate of return on their previous assets or the average of their income over the past 3 or 4 years.

I think no one is suggesting that we should go back to the morass of the World War II and the Korean war excess profits taxes. It is hard enough to apply such taxes to manufacturing industry; with respect to the oil industry, it is practically impossible, totally unworkable.

I think the excise tax that the President has proposed will capture those kinds of windfalls that we would anticipate would accrue to royalty owners and producers and do it in a way that we can administer and which will be understandable to the industry.

Senator DOLE. I think it is good to recognize your proposal is an excise tax. Saying we are going to impose an excise tax may not have the same connotation before a microphone.

But, when you talk about a "windfall profits tax," that really is a bell ringer.

Mr. SUNLEY. I believe Mr. Nixon used the same term. It is an old term.



Senator DOLE. He is no longer with us. He is not here anymore. We cannot blame him for anything now.

Mr. SUNLEY. It is also, I understand, very similar to the windfall profits tax that your finance committee passed in 1975.

Senator LONG. I do not suggest they were all accurate; I just want you to be accurate, because you are nonpartisan, and some of us are too, but there are some who are not.

What I think the bottom line is, I assume there will be some sort of tax, excise tax or whatever. Maybe that is necessary. I assume the reason these oil companies that apparently profit so much go out and buy other assets is because they can make more profit on nonenergy assets than in energy. That is why I am wondering why you would not want them to stick to energy.

Mr. SUNLEY. In 1977, as I pointed out in my statement, the industry spent about \$700 million in cash to acquire investments in other firms. That represented between 1 percent and 2 percent of their total funds.

To go back to 1974, 1975, then you are talking about substantially more money spent to acquire other firms.

Senator DOLE. In 1982 the tax would be \$6 billion?

Mr. SUNLEY. The additional income that would accrue to the industry?

Senator DOLE. The amount of the taxed.

Mr. SUNLEY. After tax, the increment first 3 years is nearly \$6 billion.

Senator DOLE. That is the amount of tax?

Mr. SUNLEY. The amount of after-tax receipts by the oil industry and the royalty holders.

Senator DOLE. The net. Under the President's excise tax how much revenue is raised by the tax?

Mr. SUNLEY. In 1980, the first year in which the tax is in effect, the split is \$200 million from the lower tier portion of the tax and about \$550 million from the upper tier portion.

Senator DOLE. Is there a big jump in revenue after the decontrol ends in 1981?

Mr. SUNLEY. The lower tier portion of the tax phases out, as you know, by 1983. The amount of revenue raised by using the base price of lower tier oil, is \$200 million in 1980, \$850 million approximately in 1981, \$880 million in 1982, and \$70 million in 1983; zero after that.

Senator DOLE. No more questions, Mr. Chairman. Thank you.

Senator GRAVEL. Senator Durenberger?

Senator DURENBERGER. I have a whole stock of very significant questions, but I would like to submit them in writing. One that ties in with the response to my first question, I think that Mr. Smith indicated his understanding of table E was a constant world price. I wonder if Treasury has projections of what the world price of oil will be after controls, on and after, and what their expectations are about the United States trying to sell at the world price at that point?

Mr. SUNLEY. I think it is impossible to make a projection of the future world price of oil. That is why, for purposes of our analysis of the windfall profits tax we assumed two cases. The base case essentially assumes the OPEC price rises with inflation; there is no real OPEC

price increase. This allows us to determine how much revenue we would be getting from the lower tier and upper tier portions of that tax.

We also estimated what would happen if there were a 3-percent-per year real increase in the OPEC price, and that gives us a different projection of how much revenue we would get.

So obviously, as an administration, we have some difficulty in making a projection here, because it gets very close to endorsing a price for OPEC. Obviously, we do not favor increases in the real price of oil. That price is essentially set by cartel; it is not a competitive price.

Yet many fear that over the next several years there will probably, in fact, be real OPEC price increases. How high, I do not know.

Senator DURENBERGER. Is it safe to assume that the administration assumes that U.S. oil producers after controls are gone will sell at the world price, whatever it is?

Mr. SUNLEY. Yes. The price paid by refiners, first purchasers, and eventually the price that is reflected in the oil consumed in this country will reflect the OPEC price, the world market price.

I think that is very important, if we are going to get adequate conservation and adequate incentives for production.

Senator GRAVEL. Senator Baucus?

Senator BAUCUS. Thank you, Mr. Chairman. I apologize for being late. I just have a couple of questions.

No. 1, is not the basic assumption of the administration proposal that by phased regulation—and, mind you, some sort of profits tax—that the company will become more self-sufficient in energy production?

Mr. SUNLEY. That is correct. We anticipate that the higher oil prices will have a production response, and we did look at the estimates that the administration assumes which were given in one of my appendix tables. We also assume that the higher prices will result in conservation of energy, that people will use less oil as a result of the higher prices.

Senator BAUCUS. Following up on Senator Dole's question, it seems to me that the basic proposal is a little obscure. It is glancing at the problem, rather than a direct hit.

If there are no prohibitions against using the additional revenue to invest in nonproducing investments, that, to me, is an indication that perhaps this is not aimed directly at the heart of the problem. I am just curious, if you would expand a little bit more fully why in your judgment, the administration's judgment, does it make more sense to put on some kind of restrictions on the use of the additional revenue? What nature of investment, domestic or foreign?

I think, from your earlier testimony, certainly from the administration's testimony, I think most Americans agree that we have a serious problem facing us. I am just a little curious as to why the proposal is not more directly aimed at the heart of the problem.

Mr. SUNLEY. In responding to Senator Dole, I started to explain our problem with the plowback kinds of provisions. On the one hand, you can end up with such broad definitions that every producer will clearly make sufficient investments in the right sort of things so that they will not have any windfall profits tax; they are out from under it. Then you have a tax that is essentially a sham. I do not think that that is what the American people want.

Alternatively, one can define the investments that qualify for plowback very narrowly. We may say refining capacity does not count, pipelines do not count, development wells do not count. It is only exploratory wells that qualify. Then only expenditures in excess of what you spent in the past 3 or 4 years, something of that sort.

But once we begin to try to define the qualified expenditures that narrowly, we create tremendous distortions in the investments of the oil industry as between what is good investment and what is bad investment.

Not only that, but with respect to the good investments, we discriminate against any new entrant into the industry. If I am now in the industry and have these windfall profits, therefore I get a tremendous investment subsidy, 50 cents on the dollar in most of the plowback proposals I have seen, if I go ahead and make additional investments.

If I do not presently own controlled oil but wish to invest my funds in oil and make my contribution to the Nation's energy supply, I do not get that subsidy. Plowback becomes an anticompetitive factor.

It is my understanding that some Members of the House have suggested they would support the President's windfall profits tax, but that only 50 percent must be paid, the second 50 percent, if you will, be eligible for some kind of a plowback. Essentially, a 100-percent windfall profits tax would be imposed, but a producer might keep half if he makes approved investments.

Senator BAUCUS. Do you support that?

Mr. SUNLEY. We are looking at it. We have serious reservations about plowback.

Senator BAUCUS. If you are looking at it, why do you not take a look at some other proposal, perhaps somewhere along the lines that Senator Dole suggested, some limitation or some proposal that directly goes to the heart of encouraging greater American production?

It seems to me if we deregulate and that is the end of it, then the money can be spent in a whole host of areas, a whole host of ways, and where are we and what have we accomplished?

Mr. SUNLEY. You are talking about a theoretical possibility?

Senator BAUCUS. That is correct.

Mr. SUNLEY. You are right. In 1974 and 1975, the industry spent a good portion of their total sources of funds to acquire other companies but as I said, we have serious doubts that the Government knows absolutely best in every instance what the industry should spend its funds on.

I think it would be unadvisable to start down that path, that the Government determine the investment of not only this industry, but possibly additional industries, as well.

Senator BAUCUS. I think that is right, but certainly this is an age when government is being asked to back off. I would just think that the administration could more compassionately think up a whole series of various proposals, at least for the sake of common purpose, both down there and on the Hill, to find some solution that strikes a balance between excessive regulations, which we do not want, and yet, on the other hand, trying to fashion a proposal that more directly goes to the heart of the problem.

What percentage increase in domestic production do you project with the administration's proposal?

Mr. SUNLEY. We are projecting that in 1985 the additional production that results from decontrol will represent 17 percent of the total domestic production. This increment includes both additional tertiary production resulting from administrative actions and the new primary and additional secondary production from old fields. Induced production starts off very low—1 percent in 1980, increasing to 4.6 percent in 1981, a steady rise in even steps—so we expect that in 1985 about 17 percent of domestic production will be induced.

Senator BAUCUS. Seventeen percent increase?

Mr. SUNLEY. Twenty percent of base case production or 17 percent of the total is represented by the induced production.

Senator BAUCUS. What increased foreign production do you project?

Mr. SUNLEY. Domestic decontrol should not have an impact on foreign output. We do not have an estimate of that. The cartel will control production to affect the price received.

Senator BAUCUS. But it is additional revenue that may be used for production, is it not?

Mr. SUNLEY. The place they will have improvements in their returns is with respect to domestic investment, not foreign investment.

Senator BAUCUS. Thank you very much.

Senator GRAVEL. I would like to pursue that. Seventeen percent would be about 1,500,000 barrels per day increase?

Mr. SUNLEY. The additional production in 1985 would be about 1.6 million barrels per day.

Mr. GRAVEL. That is how much money? How much money does it cost us to get to that? How much money additionally are you throwing into capital markets, just dollars? Round it off.

Mr. SUNLEY. I do not know what you are asking.

Senator GRAVEL. How much money, additional wells, are you throwing into the energy area as a result of decontrol to get that 17-percent increase?

Mr. SUNLEY. I assume you mean the net increase on oil company receipts before taxes?

Senator GRAVEL. Yes. Gross capital.

Mr. SUNLEY. Let me see.

Senator GRAVEL. Not receipts, the new capital they are getting. We were settling on this figure of \$20 billion a year.

Mr. SUNLEY. We are assuming in the period 1979-85 that the decontrol program will lead to an increased cost of production of \$28.9 billion.

Row 2 of the last appendix table of my testimony, appendix table 14, I believe—

Senator GRAVEL. So with \$28 billion more, in round figures, we get a 17-percent increase. This is about 1.6 million per day and today's production is what, 9 million?

Mr. SUNLEY. 8.7 million.

Senator GRAVEL. So if we took an additional \$5 or \$6 billion that you insist is excess profits and add that, what would that now translate out to in increased oil production? Let's say \$6 billion?

Mr. SUNLEY. I am not certain. I do not share the view that it is cash flow that determines investment. I think that it is the rate of return that you can earn that is likely to stimulate investment.

Senator GRAVEL. That is fine if you are talking about external financing and other things. Looking at just plain dollars, if we took the

\$6 billion that you are going to take in tax and redistribute it in our society and you left that \$6 billion there, it has got to give you more oil coming out, if you require that it be spent, if you had a plowback requirement.

Mr. SUNLEY. It may very likely be the case, Mr. Chairman, that we will get increased oil by using some of those funds to fund shale oil development and other energy research projects that the President has endorsed as a part of the energy security fund. But I do not have the actual number you were looking for. We do not have a number for that.

Senator GRAVEL. Let's say 400,000 barrels a day more. Why would we set up a policy when we recognize that we have dependency that we are trying to change and then come in and say we are for deregulation but, at the same time, we want to deny the capital that would be a product of that deregulation going to industry and raising our productive capacity?

It does not make any sense to me. I can pose the question another way.

Supposing next year you deregulate oil. After it is deregulated and you have your excess profits tax on to recapture, OPEC raises its oil one year to \$20 a barrel. Are you going to come back in and say that is now excess profits and we have to tax that?

The logic would seem to be consistent.

Mr. SUNLEY. The third tier, or the President's windfall profits tax, is a permanent tier. It is designed to capture just that kind of windfall that you have described.

Senator GRAVEL. That takes place in the future?

Mr. SUNLEY. That is quite right.

Senator GRAVEL. How does that go with Mr. Smith's statement a little while ago that we get more capital into the oil business?

Mr. SMITH. I do not intend to say that the national interests will be served. I said that that would be one way in which we might ultimately foresee energy independence.

But no, as I indicated, I think a substantial increase in the price of oil would be very detrimental to our domestic economy.

Senator GRAVEL. What is the anticipated growth between now and 1985 on consumption of oil?

Mr. SMITH. The total consumption of oil in 1985 is estimated to be slightly higher than it was in 1978, as I recall.

Senator GRAVEL. What is slightly higher?

Mr. SMITH. Something on the order of 1 million barrels a day, or less, if I recall. That is principally due to the fact that there will be higher prices on the one hand, and also the fact that these mandatory controls on automobile mileage will become progressively more and more effective during the course of that period. Were it not for higher prices and other conservation measures, we would project oil demand to rise considerably over the years.

Senator GRAVEL. Supposing we just take an average. We cannot say how high it will rise, but you say a floor is 1 million a day. Supposing it is 1.6 million a day. Then the program you are offering Congress is merely treading water. Is that a fair statement?

Mr. SMITH. I think any program aimed at increasing oil production in the United States can do little more than tread water between now and 1985. Beyond 1985-90 it seems to me that the tertiary recovery

incentives of the program will result in very substantial, additional increases, on the order of two to three times what you experienced in 1985. It is a continually growing increment. The program of decontrols, as opposed to the continuation of controls, does result in very substantial differentials added on in later years.

If one could envision controls—

Senator GRAVEL. What would happen in later years if you replaced the excess profits tax to recoup any radical price increases? Where is the money going to come from to bring about with this great increase that you are predicting?

Mr. SMITH. Each dollar of increase in profits as a result of future oil price increases, the producer will receive essentially 50 percent of that after the windfall profits tax. There are, as we indicated, delays in the industry's rate of development that are inevitable if the producer can foresee rising world prices, even with the windfall profits tax there would be a more than adequate incentive.

At some theoretical level out there, many years in the future, one could foresee that the windfall profits tax would have a dampening impact of substantial magnitude, but Congress can revisit that issue, in the future, in the event that we do have such substantial world oil price increases.

Senator GRAVEL. What is the difference between a windfall profit and an inventory profit?

Mr. SUNLEY. I would say if you look at the first quarter earnings of some of the oil companies, reports have been coming in. They are showing substantial inventory profits. Partly it explains why their profits are so high in the first quarter of this year as compared with the first quarter of last year.

When the world price goes up, that is almost immediately flowed through to the gas pump and the heating oil bills, but the major oil companies that may have acquired supplies at the well-head have substantial quantities of oil in the pipeline, literally and figuratively, which they acquired at the old price, and which they sell at the higher world price. For companies which do not use LIFO methods, this causes a substantial increase in inventory profits when there is a one-time jump in raw materials prices.

That is not the kind of profits that we are intending to capture with the windfall profits tax which relate to the increase in producer and royalty owner income which will result from decontrol of lower and upper tier oil and also from any future real OPEC price increases.

Senator GRAVEL. Would it not be fair to say, if you are going to stay in business and you have oil, let us say at \$5 a barrel, and you can now sell it for \$15 a barrel, there is apparent windfall; but if you have to replace it at \$10 a barrel, you have a different problem altogether?

In other words, the oil companies have to replace the oil itself. That is what you are projecting.

Mr. SUNLEY. I would suggest that, with respect to the replacement oil, that the oil companies should be in the same position as anyone else in making those additional investments, and that is to say you look to your future returns to justify your current investment, your current investment outlays.

If to replace oil costs \$10 in the future, and the present value of expected future income is less than \$10, you will not make that investment. That should be the same in the oil industry as for anybody else considering investing in exploration and development.

Senator GRAVEL. That would not be entirely so if you were talking about cash return earnings as a way to go out and explore for oil. You cannot finance exploration with external sources. They can barely finance transportation with external sources. Internal sources is where you get the money to go and drill for oil in the speculative areas.

If they do not have the money to go out and do that exploration from retained earnings, then how can they expand their exploratory effort beyond what presently exists?

Mr. SUNLEY. As I said, in recent years, the oil and gas extraction industry has been spending more on investment than their cash flow. That investment includes more than just exploration and development.

Senator GRAVEL. Maybe like Alaska, when you found something and it cost considerably more to go ahead and exploit what you have found than what you had before. In that situation you can go out and project greater debt. The oil pipeline in Alaska is a classic example of it. But you still have not addressed yourself to increasing retained earnings so that they will have the money to go out and do the very difficult task of looking for oil and gas, which they cannot finance from internal sources. That is where the profits come in.

Leaving the excess profits in the oil companies, how much higher would they be in comparison to average manufacturing? Have you made any projections, like next year and the year after? They were about a point below manufacturing. How much higher would they be, looking at total operation?

Mr. SUNLEY. I have not done that calculation.

Senator GRAVEL. Could I ask that you do it for the record and submit it to us before Friday so we can have an idea as to what would be involved?

I do not want to hold you any further during the lunch hour. Just let me ask a question.

You do that computation, and do a computation based upon the capital requirements charted out of what has been used for the last 5 years, what is projected for the capital needs for the next 5 years at existing production levels and increasing production by 25 percent, then 50 percent.

Mr. SUNLEY. Mr. Gravel, those are very complicated projections to try to make. I cannot really guarantee that we can have them by Friday. We will move expeditiously on them.

Senator GRAVEL. I think you know what I am driving at. If we are going to try to change the existing picture of our situation, then we need capital. If we are talking in sums of \$50 billion to \$100 billion in order to make an improvement and the Government is trying to hang on to \$5 billion of it under the rhetoric of doing something for the American people, I think that we might see that effort as somewhat miniscule in the context of the total policy.

I would like to have some figures that will prove or disprove that. Fair enough?

Mr. SUNLEY. It is quite fair. We will try to take a look at it.

[The material to be furnished follows:]

There is no apparent way to predict how much more investment in oil and gas productive capacity would occur, and what is more important, how much net additional production this would provide, if the windfall profits tax is not imposed. However, reference to recent history affords some support for the judgment that the impact of relief from the proposed tax would be negligible.

First, Appendix Table XI shows that in the years 1973 and 1974, when the world price of oil was rising sharply, oil companies experienced annual increases in cash flow from operations approximately 50 percent. Yet, as I noted on p. 19 of my statement, those were years in which capital outlays by the oil companies did *not* keep pace with increased cash flow. Those were also years in which "new oil" was decontrolled.

Second, the estimates of domestic exploration and development expenditures shown on p. 21 of my statement also show there are restraints on rational increases in investment expenditure. Although there were big increases in bonuses paid and other land acquisition costs in those years, mainly reflecting an acceleration of Federal lease auctions, there were only modest increases in expenditures for the drilling and equipping of wells. Expansion of the numbers of drilling rigs and crews does not occur instantaneously, nor does the capacity of oil field suppliers. Therefore, rational investors in oil and gas fields gear their investment programs to a scheduling of drilling and oil field services that can be accomplished at prices they believe reflective of long-run conditions; they avoid incurring costs inflated by short-term over-utilization of existing capacity.

In sum, investment programs are not geared to short-term variations in cash flow. Investment programs are established on the basis of long-run capital budgets which include both expected cash flow and costs. Under the Administration's decontrol and tax program, we believe we have provided for a reasonable balanced between incentives to invest and the capacity of supporting industries given the likely availability of prospects to explore and/or develop. Further increases in cash-flow seem unlikely to yield commensurate increases in productive capacity. As in the past, excessive cash flows are likely to be devoted to investments in, and acquisition of, nonoil activities.

Senator GRAVEL. Are there any further questions?

Thank you very much. You have been very patient.

[The following was subsequently supplied for the record:]

DEPARTMENT OF THE TREASURY,  
Washington, D.C., June 8, 1979.

HON. MIKE GRAVEL,  
*Chairman, Energy and Foundations Subcommittees on Finance,  
Dirksen Senate Office Building, Washington, D.C.*

DEAR MR. CHAIRMAN: This is in response to your letter of May 17 enclosing a list of 26 questions relating to my testimony before the Subcommittee on May 7. Additionally, your cover letter raised two more questions. With regard to the first, we are unable to estimate the comparative impacts on oil company rates of return of oil price deregulation, with and without windfall profits taxation, 1979-1990, for the following four reasons:

(1) The increase in gross income that might be experienced under deregulation by any of the 87 companies whose financial data are summarized in the tables accompanying my testimony obviously depends on the quantities of lower and upper tier oil in which each has an economic interest. To the best of my knowledge, this is not ascertainable from information maintained by DOE; their files show only the "producer" from whom controlled oil has been purchased. Normally, the term "producer" refers to the entity that holds the operating interest in a property; invariably, the operator's share of the oil transferred is fractional, of a magnitude that depends on the number and size of royalty interests in the property he operates and, if the operation is a joint venture, on the size of other partners' shares. I know no other method than a survey of each corporation in the Computat sample to determine the extent of each oil company's net ownership of lower and upper tier oil.

(2) If company assignments of present quantities of controlled oil could be established, it then would be necessary to establish, for each company's aggregate interests in such oil, the expected decline rate so that both production subject to windfall profits tax and total production from deregulated properties could be ascertained. Again, I know of no other method than a survey by which to determine these decline rates.

(3) If both the foregoing sets of information were at hand by which to estimate each company's increment of gross income from deregulation and windfall profits tax liability, it would then be necessary to determine company net (after tax) income. For this, one would need to know amounts that would be taken by states with ad valorem severance taxes, amounts that would be paid to states with income



taxes, increments to lifting costs induced by the deregulation, and what additional drilling expenditures might be made so that both the resultant pre-Federal-income-tax and income tax liability might be computed. Again, I know of no method short of a direct survey of the affected companies to derive this information necessary to determine their post-deregulation increase in income.

(4) Finally, if information required to estimate the Compustat companies' increments to net income resulting from deregulation could be obtained, there would appear to be no way to express this as an increment to rate of return, whether on equity or total assets employed by these companies, 1979-1990. What these companies' increments to equity and to total assets might be, for both their oil field and non-oil-field activities; what their expected earnings in all their activities outside presently price-controlled oil fields might be; and whether there might be changes in net interest payments to creditors, are all essentially conjectural matters, even to corporate financial managers who might be surveyed.

With regard to the second question, we are also unable to project the capital expenditures over the next five years that would be required to maintain the current annual rate of oil production, or increase it by 25 or 50 percent. The creation of oil and gas productive capacity is not a simple function of expenditures venturers are willing to make, as is, for example, the construction of additional electric generating capacity. In the case of manufacturing or agricultural productive capacity, the expenditure of, say, \$1 million will yield a "plant" with a reasonably predictable productive capability. In the case of oil and gas reserves, the expenditure of \$1 million yields an unpredictable volume of producible oil and gas. Unlike industrial capital which is producible with the aid of labor and materials by well-documented technologies, establishment of oil and gas "capital" hinges on a discovery process the productivity of which depends not only on effort expended, "investment," but also on the quality of geological prospects available for exploration and a large random element.

Retrospectively, "ex post", one may sum up expenditures made and crudely measure the oil and gas found—I say "crudely" measure because the inherent characteristics of oil and gas reservoirs which determine their ultimate productivity, given some set of expected prices of oil and gas, are never known with reasonable certainty until many years of drilling and production have passed. Such retrospective comparisons of expenditures made and oil and gas found clearly indicate that, in the U.S. provinces that have been extensively explored, and given the past history of oil prices, the costs of establishing an additional barrel of daily productive capacity have been rising. What cannot be ascertained is the additional capacity that might have been established if more had been spent in those provinces each year. Assuming only the superior prospects were exploited, additional effort would simply have yielded less per dollar. Nor can we presently forecast whether the provinces now open for exploration and development will prove to be more or less productive, per dollar of expenditure. Perhaps in those provinces as yet unexplored, on- and off-shore, prolific deposits remain to be discovered that will reverse this trend in yield per dollar invested. But whether such a prospect will be realized is as much a function of increments to the store of geological knowledge as it is of venturers' willingness to undertake risky investments, both of which I am unqualified to predict.

I am enclosing responses to the aforementioned 26 questions, along with the material you have requested. If you or the Subcommittee staff have any problems with these responses, please call me or Mr. Fiekowsky (566-8282) who, you may remember, accompanied me May 7.

Sincerely,

EMIL M. SUNLEY,  
Deputy Assistant Secretary.

Enclosures.

#### DEPARTMENTAL RESPONSES TO SENATOR GRAVEL'S QUESTIONS

1. Petroleum as a percentage of gross domestic product has been declining. In your testimony you noted this decline and attributed it to a decline in domestic oil production since 1970. Has petroleum on a world-wide basis been declining during this period also?

Measures of gross domestic product relate to "economic units" comprised of national political jurisdictions; there is no comparable measure for the world as a whole. However, since both total world output of oil and its relative price per unit have been increasing since 1970, it is reasonable to infer that the petroleum share of world product has either increased or held steady. In any case, petroleum exporting countries have enjoyed an extremely large increase in their share of world output.

2. On page 4 of your written statement you discuss the size of the integrated oil companies and illustrate their economic concentration. Is it correct that the proposed windfall profits tax makes no distinction between integrated oil companies and so-called independent producers? Has any consideration been given to applying the tax only to the large integrated oil companies?

Because the windfall profits tax is imposed on the increase in selling prices of the three categories of oil, it is payable uniformly by any legal owners of that oil, except the United States Government itself. Since the tax is aimed toward absorption of windfalls resulting from decontrol and from the actions of OPEC, there is no efficiency of equity objective served by distinguishing among the owners and recipients of the oil windfalls those who are "independent," or non-integrated, oil producers and all others who have claims to the oil.

3. On page 5 you state that the income of U.S. oil companies is predominantly foreign. This characterization is on an industry-wide basis. Is this an accurate characterization, or are some much stronger in foreign operations than others (probably due to a late entry into the foreign markets)?

There is no generalization which uniformly fits all members of the oil industry. It is therefore as likely, as you suggest, that some integrated oil companies will have disproportionately larger shares of foreign oil production income in their financial accounts as some have larger shares of domestic refining, transportation, or marketing income.

4. In your discussion of investment and fixed plant (or fixed assets) are offshore platforms included in the category "fixed plants"?

"Fixed plant" is an asset category that commonly includes investment in plant and equipment, as distinguished from inventories, investments in securities, and other classes of assets. Offshore platforms, along with certain other oil field investments, such as storage facilities, separators, pipelines, etc., that are capitalized by oil companies for financial reporting are included in "fixed plant."

5. Explain why the percentage of fixed assets to total assets would be increasing for independent producers but declining for large integrated oil companies.

There are two reasons why independent oil companies manifest a tendency toward a higher percentage of total assets invested in fixed plant as compared with integrated companies, 1973-1977. First, by definition, independent companies are principally engaged in oil and gas extraction so that, as compared with integrated and oil refining companies, they have not experienced the large increase in crude and product inventory values resulting from the post-1972 price rises that have swollen this non-fixed-plant element's share of integrated companies' total assets. Secondly, many independent oil companies follow "full cost" rules to account for their expenditures on exploration and development. Thus as both independents and integrated companies have stepped-up expenditures of this kind, more of the step-up is capitalized by independents, swelling their fixed plant totals, than by integrated companies. Ultimately, when production begins to flow, the independents will "deplete" or amortize their capitalized oil field investment by larger amounts than integrated companies, and this will restore the previous fraction of total assets invested in fixed plant that is similar to integrated firms.

6. With respect to debt equity ratios for both independent producers and large integrated oil companies, do most analysts agree with you that these ratios are not too high?

Perhaps the most meaningful indexes of financial analysts' views about oil companies' decline in the equity percentage of total assets (increase in debt-equity ratio) are credit and bond-ratings. I know of no indication that oil company bond issues have suffered any downgrading since 1974. As I noted in my testimony, book-values of oil company oil and gas reserve assets have been progressively understated since the oil price bulge of 1973-1974, a fact of which analysts are well aware.

7. How is the stock market reacting to the decontrol statement with respect to that portion of the industry which provides material, capital and labor (e.g., drilling equipment, etc.)? How will this affect Federal lease prices?

Recent developments in world energy markets have caused both oil field service companies; and energy companies' issues to be cited as bullish investments. I am confident the Administration's decontrol and tax program has not altered this tone of the market. These circumstances conveying optimism about prospects for domestic energy markets should carry-over into higher lease bonus bid offers in the near future.

8. Are the average tax rates set forth in the summary schedule on page 11 the rates that the Treasury Department uses when estimating revenues from these

proposed taxes? Would this rate be used when computing the amount of additional income taxes to be added to the energy security trust fund?

As I explained in my testimony, we did not apply effective tax rates to estimate the revenue impact of the decontrol and windfall profits tax proposal. Rather, we followed the procedures I outlined above that would be required to estimate company profit rate changes. On the basis of *overall* estimates of oil quantities to be decontrolled and additional production induced, we estimated both the gross windfall profits tax and the residual increase in *gross* receipts of domestic oil owners. Some of this goes to nontaxable royalty owners, some to taxable royalty owners (a source of tax revenues) and the remainder goes to business entities. From the net-of-windfall-profits-tax receipts we subtracted state severance and income taxes, estimates of additional lifting costs, and an estimate of additional drilling costs that will occur and be taken as deductions for tax purposes. Having thus arrived at *taxable* incomes, we multiplied these by appropriate statutory tax rates, allowing for the remnant of percentage depletion, to derive our estimates of net income tax revenue flows. The computed details are shown in Table XIV of my testimony. As may be seen in the bottom row of that table, the effective tax rate on the increment of aggregate oil producer income resulting from these estimation procedures ranges about 39-40 percent.

9. What is the average effective tax rate on U.S. business? On world-wide business? what is their total average effective tax rate, including state and local taxes, Federal taxes, foreign taxes?

The most recent study of corporation effective tax rates we have completed is based on 1972 returns. I am enclosing a copy which reports in Sections IV and V of Table 1 (p. 44) that U.S. corporations paid an average effective tax rate of 37.8 percent with respect to U.S. source income and 56.1 percent with respect to foreign income. Section III of that same table reports that 40.9 percent of corporations' worldwide income was paid as income tax to foreign governments and the United States. We have no means by which to recompute these effective tax rates to account for state and local tax returns. I would venture the guess, however, that if pre-tax income is redefined to include these other taxes the resultant effective tax rates would not be greatly altered.

10. It is noted that the bulge in rates of return due to the 1973 embargo receded very quickly. Do you have any prediction as to how quickly the rates of return might recede from decontrol?

Any profit rate bulge resulting from a discrete change in market conditions is likely to recede as quickly as that experienced in 1973-1974. However, I would remind you that decontrol, over a 28 month period, in combination with an unpredictable OPEC pricing and output policy, do not constitute a single discrete change in oil markets.

11. Is it your understanding that most companies, when evaluating expenditure programs, look for approximately a 15 percent return on investment? If so, is it reasonable to measure profitability, even profitability following decontrol, by that benchmark?

Although discount rates used by companies for evaluating investment projects are closely held proprietary secrets, I have heard informally that discount rates of 15 to 20 percent are commonly used by managements throughout industry. But these before-the-fact ("ex ante") discount rates used for project screening purposes are not appropriate bases for evaluating after-the-fact ("ex post") measures of profitability. Because investment planning and execution are subject to great uncertainties, rightly or wrongly, investment decisionmakers add a substantial risk premium to their screening rules in the hope that realized rates of return will approximate the norm of 10 to 12 percent.

12. Is it true that more cash flow to the oil companies may be eaten up by "capital consumption" than may at first appear (pages 14 and 15)? Is this due to the effects of inflation on capital items and the resource itself? Other factors?

Due to the restrictive conventions of financial and tax accounting that do not permit the formal recognition of income in the year in which it actually has been produced, or earned, it is certainly correct to infer that the financial accounting for "capital consumption" is particularly misleading in the case of oil and other minerals companies in periods when both real costs of replacing the capital consumed in extraction are rising and there is a marked general inflation.

For obvious reasons, it is impractical to evaluate the value of reserves discovered by the outlays made for that purpose and to record the increment simultaneously as income in the discovery year and as a write-up of the book-value of the company's assets to be recovered as "capital consumption"—depletion in the case of

minerals companies—as the deposit is exhausted by production. Thus, book allowances for the capital consumed in minerals production are inherently understated in financial statements, and when the costs of replacing that same capital have increased, because the quality of geological prospects has deteriorated, and/or because inflation of the price level has caused current dollar measures of physical magnitudes to rise, the degree of understatement increases. Although inflation has a similar biasing effect on reported net incomes of nonmineral companies, this effect is probably less severe. An understanding of these accounting mirages may well be one of the prime reasons why stockmarkets have “discounted” post-1972 oil company earnings more than they have those of nonoil companies. (See “(book) return to market value of equity”, Appendix Table X.)

13. On page 17 of your written statement it is implied that tax-preferred capital outlays by oil companies, especially in independent drillers, have been rising since 1974. Is this because their activities have increased? How is this affected by the diminishing percentage depletion for independent producers?

“Deferred taxes” are accounted for in financial statements whenever current deductions permitted for tax purposes with respect to current or prior year capital outlays exceed those accounted for under financial reporting rules. Since what is involved is a *premature* tax deduction, not a permanent forgiveness of tax, the resultant difference in current year income tax payable is properly treated as a “deferred tax” or interest-free loan. In the case of oil companies, intangible drilling cost (IDC) deductions are a principal source of deferred tax. This is particularly true of “independents” which use “full cost” accounting rules in their financial accounts. Thus you are correct to infer that the growth of deferred taxes in the post-1972 period among oil companies principally engaged in extraction reflects the increase in their expenditures for exploration and development that generate interest-free loans.

Traditionally, percentage depletion deductions are accounted for by oil companies eligible to receive it as simple reductions in tax. This is conceptually correct because, as you know, percentage depletion deductions are not merely substitutes for a recovery of capitalized costs of establishing a well, they are permitted even when there is no cost to recover. Percentage depletion is thus essentially a tax rule for reducing a taxpayer's income otherwise subject to tax; it represents a forgiveness of tax, not a deferral.

14. On page 18 you state that “there is no evidence that oil companies are somehow more reliant on cash flow than companies in other industries.” Is this a universally held view, or would others disagree?

If one believes that oil companies make investment decisions as rationally as do nonoil companies, then they can be no more dependent on cash flow than other companies. Naturally, in the debate over oil price deregulation and the accompanying proposed windfall profits tax I would expect spokesmen for the industry, and even others who believes the terms of the proposed tax to be too harsh, to rely on a crude cash flow argument. To wit, they will argue that deregulation, by increasing producers' cash flows will thereby cause the increment to be spent on new productive capacity and that the windfall tax, by reducing cash flow, will *pari passu* decrease investment spending. Not only does this argument imply oil companies are irrational managers of funds, it is controverted by the facts I reviewed in my testimony.

In sum, deregulation will stimulate investment by making the prospects for doing so more attractive, particularly those prospects for increasing recovery from existing fields. These investments warranted by rational comparisons of expected returns and costs will be financed by oil companies as all such projects are, by both internal and external sources of funds. While it is true that wildcatting, *per se*, must be financed with internal funds, the larger amount of associated investment in development, storage, and transport facilities is readily financeable with external funds, particularly debt. Finally, it should be remembered that capital formation in the energy industries can be financed with equity and loan funds derived from outside the existing members of the energy sector; these funds will as readily flow into the energy sector in the future when prospects are made attractive as they have in the past.

15. Looking at the uses of oil companies' funds, it appears from your testimony that following the 1973-74 boost in earnings, the money did not go to shareholders. Did it go into capital expenditures, and perhaps into drilling and development? What other expenditures?

As you suggest, and as the sources and uses of funds statements presented in Appendix Table XI show, the principal uses of post-1972 increments to sources of funds were for capital outlays, increases in working capital, and investments in other firms' securities.

16. Are geological and geophysical expenditures subsumed within the category "capital outlays"?

Generally, geological and geophysical (G&G) expenditures are treated for financial accounting purposes in the same way as their counterpart expenditures are in nonoil industries. Generalized G&G, i.e., expenditures made without regard to a particular lease but only to generally gain information which may be of use later, is treated as R&D and currently expensed. G&G expended with respect to a lease is generally capitalized, i.e., considered a capital outlay, a use of funds; these capitalized expenditures are recovered as production ensues or when the lease is determined to be unproductive, and when this occurs, the recovery (capital consumption) is considered a source of funds.

17. Did the oil companies "drill up" the 1973-74 bulge in earnings? Is this reflected in the testimony presented by the Treasury Department?

The evidence reviewed in my testimony would suggest oil companies did not "drill up" their bulge in earnings, for capital outlays declined as a percentage of cash flow or total sources of funds. Due to the fungibility of money, there is no way to trace the 1973-74 dollars of increased cash flow to determine which of those dollars were spent on drilling, which on refining and transport, which on acquisitions and investments, and which were paid out as dividends. It is therefore not informative to compare amounts spent on drilling with the apparent \$18 billion increment in oil companies' cash flow in 1974-73 as compared with 1972.

18. Can you supply for the record a copy of the Joint Association's survey referred to on page 20 of your statement?

19. Does the summary schedule on page 21 entitled, "Exploration and Development Outlays" refer only to outlays in the United States.

I am forwarding a copy of the *Joint Association Survey* for 1975. As you will read therein, the expenditures estimated refer only to operations within the jurisdiction of the United States.

20. Is it likely that the Federal government will benefit from increased oil company revenues in the form of higher lease acquisition costs and increased bonus bidding? What are the projected increased earnings for the Federal government in royalty revenues and bonus bids.

If the attractiveness of investment in oil reserves is increased, this will not only raise bonuses and/or royalties on private lands as compared with what they would otherwise be, they will also raise those payments to the Federal government with respect to newly acquired leases on public lands. However, due to the present uncertainty about the location and acreage to be leased, we are unable to project the increments to successful bids that might be attributable, to the improved investment climate resulting from deregulation.

21. Looking at investments and acquisitions outside the oil business by oil companies, how so oil companies compare with other manufacturing companies historically in spending or investing outside their own business?

So far as the data we have reviewed permit us to judge, oil companies have not manifested a notably greater propensity to diversify into other industries than do nonoil companies. Although the percentages of cash flow or total sources of funds used by oil companies for investments and acquisitions more often than not exceed the same percentages for nonoil companies (see p. 22 of my testimony), it is not clear, as I noted, that these acquisitions are exclusively, or generally, outside the oil or minerals industries.

22. What factors influence oil company investment in businesses outside the oil business? Do conditions in the economy at large play a role; that is, whether the target businesses are especially cheap at that time? What is your evaluation of the idea that fossil fuel is simply going out of existence? Are oil companies still heavily concentrated in fossil fuels?

Operating on the assumption that oil company managements are as rational as any group in the private sector, I would speculate that one of the principal determinants of large oil company diversification strategies since 1972 has been the drying-up of investment opportunities abroad. As I noted in my testimony, foreign operations have loomed large in the total cash flow of oil companies whose financial statistics dominate most of the aggregates we have reviewed. In view of foreign government hostility and out right expropriation of oil company property rights abroad, it would be a dereliction of oil company managements' fiduciary responsibilities to their stockholders if they were to persist in maintaining their old patterns of global investment in oil and gas reserves. Since the geographical scope for oil industry investment has drastically shrunk, at the margin, investment of available funds in other industries becomes relatively more attractive, given the tax penalty on distribution to stockholders.

I know of no evidence that would suggest fossil fuels will have disappeared from use within any time horizon useful for private or public planning purposes. If OPEC persists in maintaining artificially high prices for oil, and if the environmental costs of obtaining and using substitute fossil fuels continue to mount, I would expect that technologies for producing alternative energy sources will develop, along with complementary technologies for reducing the energy content of our standard of living.

I am unable to respond to your question about the percentage of oil company activity devoted to fossil fuels and whether this has been changing. "Line of business" data are still unavailable; and when they do become available, I am not sure the definitions of "line of business" will be analytically adaptable to the question you have asked.

23. The Treasury Department has taken into account the feedback effects of decontrol on domestic crude production. Will the Treasury Department be utilizing feedback estimates from this time forward?

In our analysis of the impact of decontrol and the proposed windfall profits tax we have not followed a new procedure. In all similar proposals which impact a particular sector of the private economy, the Treasury has always striven to account for the response to proposed policy changes. What we try to avoid is the imputation to individual elements of a comprehensive package of tax and expenditure changes certain macroeconomic effects produced by the entire package.

24. In Appendix XIV it appears that estimates of additional oil receipts and taxes are susceptible to two variables. First, changes in OPEC prices; and second, increases in state and local severance and income taxes. Does anything in the President's proposals inhibit States from increasing their taxes and thus decreasing the Federal share? Could a State enact its own windfall profits tax?

Under the President's proposal, the windfall profits tax is technically an excise tax and, hence, not affected by states' actions to modify their severance, property, or income taxes affecting oil production. The right to levy direct taxes, on property or income, is specifically reserved to the states under the Constitution. The only inhibition to states increasing their levies, such as severance taxes or their own windfall profits taxes, that have the unfortunate consequence of discriminatorily discouraging mineral investment within their borders is the commonsense awareness of state legislators that such policies drive out industry and shrink state economic bases.

25. Assuming that only domestic production is subject to the windfall profits tax, is not this an incentive to produce abroad? Isn't this a type of subsidization of Arab oil? Has there been any significant influx of foreign-owned companies into our domestic oil and gas business? Do you foresee such a trend?

For oil companies with properties or production rights both in the United States and abroad, production from either set of properties is independent of the tax and other national policies prevailing elsewhere. Production from U.S. properties will be pushed to the level the owner feels is justified by lifting costs and expected revenues; and this decision is unaffected by whether the host country where the same company has oil properties abroad has raised taxes there, or otherwise made his foreign operations less profitable. By the same token, deregulation and imposition of a windfall profits in the United States cannot affect an oil company's foreign production decision.

If, and only if, it can be demonstrated that the terms of the windfall profits tax discourage domestic production, as our price controls certainly have done, can it be said that the tax "causes" an increase in our foreign oil dependence. On the other hand, our remnant of percentage depletion and IDC expensing privileges certainly constitute a subsidy to domestic production, the existence of which should not be forgotten when assessing the sum total of the effects of Federal oil policy.

In any case, whether we net subsidized or discouraged domestic oil production, it is not accurate to say that the effect on our degree of import dependence results from oil companies substituting U.S. for foreign, or foreign for U.S., oil production. We will simply produce more or less in the United States depending on costs and market conditions here, including the net effect of Federal policies. If we produce more domestically and import less, the reduced imports are shared by all foreign producers; conversely, if we produce less, all foreign producers will share the increase in our imports.

26. Does the windfall profits tax in any way affect those businesses which contract with the oil companies, such as drilling equipment companies?

If the proposed windfall profits tax can be demonstrated to retard the rate of investment in oil and gas fields, this retardation of investment would reduce the volume of business booked by contract drillers and oil field service companies. But as I have noted in my testimony, and reiterated in responses to earlier questions, there is no evidence on which to base an inference that the proposed tax will retard economically justified investment. Thus there is no evidence that the tax will affect businesses which supply oil and gas field services.

# **1975 Joint Association Survey of the U.S. Oil and Gas Producing Industry**

## **Section II: Expenditures for Exploration, Development and Production**

**Statistics Department**

**MARCH, 1977 EDITION**

**SPONSORED BY:**

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## **PREFACE**

The purpose of the Joint Association Survey is twofold: (1) to provide annual information pertaining to the cost of drilling oil and gas wells and dry holes in the United States; and (2) to provide annual information pertaining to expenditures for finding, developing, and producing oil and gas in the United States.

Estimates of expenditures in 1975 are presented in this issue of the JAS identified as Section II. Drilling costs for 1975 were previously reported in Section I of the JAS and published in February 1977.

As in prior years, data for the 1975 JAS were collected from the petroleum industry through the joint efforts of the American Petroleum Institute, the Independent Petroleum Association of America, and the Mid-Continent Oil & Gas Association.

There has been a continuing effort to improve the quality of the data reported in the JAS. As a result, the information reported for 1965 and prior years is not strictly comparable with the more recent surveys.

Washington, D.C.

March 1977

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**JOINT ASSOCIATION SURVEY — 1975**  
**SECTION II: EXPENDITURES FOR**  
**EXPLORATION, DEVELOPMENT,**  
**AND PRODUCTION**

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**SUMMARY OF FINDINGS FOR 1975.** Findings pertaining to 1975 expenditures for exploration, development, and the production of oil and gas in the United States may be summarized as follows:

- Total estimated expenditures for exploration, development, and production amounted to approximately \$19.4 billion in 1975, an increase of 2.0 per cent over 1974.
- Estimated expenditures for exploration amounted to \$5.8 billion in 1975, a decrease of 35.1 per cent over 1974.
  - Estimated expenditures for lease acquisitions amounted to \$1,679 million in 1975, a decrease of 70 per cent over 1974.
  - Estimated expenditures for drilling and equipping exploratory wells amounted to \$2,298 million in 1975, an increase of 39.5 per cent over the previous year.
- Estimated expenditures for development amounted to \$7.0 billion in 1975, an increase of 56.0 per cent over the previous year.
- Estimated expenditures for production amounted to \$6.7 billion in 1975, an increase of 17.6 per cent over 1974.
- Expenditures (in millions of dollars) by major categories for the years 1971-1975 are as follows:

**SUMMARY OF EXPENDITURES**  
**BY MAJOR CATEGORIES**

	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>
Exploration	2,393	3,672	5,865	8,901	5,779
Development	2,671	3,093	3,255	4,476	6,983
Production*	<u>3,851</u>	<u>3,912</u>	<u>4,235</u>	<u>5,685</u>	<u>6,683</u>
Total	<u>8,915</u>	<u>10,677</u>	<u>13,355</u>	<u>19,062</u>	<u>19,445</u>

\* Includes production and ad valorem taxes.

NOTE: Totals for each major category (Exploration, Development, and Production) have been revised to include expenditures for General & Administrative Overhead previously reported separately.

**DESCRIPTION OF SURVEY.** The purpose of Section II of the Joint Association Survey is to provide annual information pertaining to expenditures incurred by operators incident to finding, developing, and producing oil and gas. It should be noted, however, that estimates in Section II do not include the substantial sums paid out for income taxes, interest charges on debt capital, and returns to investors.

**PROCEDURES.** The procedures used for estimating total industry expenditures in 1975 were the same as those used in previous years. These procedures may be summarized as follows:

1. Respondents were requested to submit data pertaining to (1) expenditures for exploration, development, production, and overhead; (2) revenues from oil and gas producing operations.
2. Companies reporting to the 1972 Census of Mineral Industries were classified into thirteen class intervals according to the value of shipments. Each JAS respondent was assigned to one of these class intervals on the basis of the revenue reported to the JAS. The average size of companies in each size classification not reporting to the JAS was determined by subtracting the number of reporting companies and their revenues from the total number of companies and total revenues in each interval. (For this purpose, total revenue was that reported by the Bureau of Mines as value of oil and gas production at the wellhead for 1975 adjusted for net royalty payments and other lease revenues.)
3. Regression equations describing the relationship between company size (measured by revenue reported to the JAS) and various types of expenditures were used to estimate the volume of expenditures by companies that did not report to the JAS. Estimates of total expenditures were made by adding reported expenditures and estimated unreported expenditures.

**DEFINITIONS.** Definitions of terms used in the 1975 survey are contained in the notes and instructions which accompanied the 1975 questionnaire. (See Appendix.) These definitions are the same as those used for the 1966-1974 surveys, but they differ in certain respects from those used in previous years.

**THE 1975 SAMPLE.** Estimated expenditures in the U.S. for 1975 were derived from data reported by 371 companies engaged in exploration, development, and production activities. The net revenues from the sale of oil and gas reported by these companies accounted for 75 per cent of the total estimated net revenues from the sale of oil and gas by the industry. The following tabulation shows the reported net revenues relative to total estimated net revenues for five survey years.

	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>
Total Estimated Net Revenues from Oil and Gas Production (millions)*	\$13,421	\$13,509	\$15,259	\$23,931	\$27,252
Net Revenues from Oil and Gas Production Reported to JAS (millions)	\$10,336	\$10,652	\$11,857	\$18,389	\$20,496
Unreported Revenues (millions)	\$ 3,085	\$ 2,857	\$ 3,402	\$ 5,542	\$ 6,756
Per Cent Reported	77.0%	78.8%	77.7%	76.8%	75.2%

\* Represents net revenues from production after deducting royalty payments of 15 per cent from the gross wellhead value of all production, as reported by the Bureau of Mines.

**COMPARISON OF 1975 FINDINGS WITH PRIOR YEARS.** Detailed estimates of 1975 expenditures for exploration, development, and production of oil and gas in the United States are shown in Table 1, page 4, together with comparable data for the years 1971 through 1974.

**ESTIMATED NET REVENUES FOR 1975.** In order to provide an estimate to expenditures for finding, developing, and producing oil and gas, it is necessary for respondents to report revenues from oil and gas operations. This information is used as an integral part of the procedure for estimating industry expenditures. However, revenues reported for the JAS are not used to derive an independent estimate of total revenues from oil and gas operations.

For the year 1975, the Bureau of Mines reported \$32,061 million as the value of oil and gas production at the wellhead. To establish an estimate of total revenues from oil and gas producing operations, the Bureau of Mines figure was adjusted for royalty payments, other lease revenue, and royalty receipts as shown below.

	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>
	..... millions of dollars .....				
Total Estimated Net Revenue from Oil and Gas Production*	\$13,421	\$13,509	\$15,259	\$23,931	\$27,252
Other Lease Revenue	57	53	56	72	69
Royalty Payments Received	<u>326</u>	<u>321</u>	<u>359</u>	<u>478</u>	<u>555</u>
Total Revenues	<u>\$13,804</u>	<u>\$13,883</u>	<u>\$15,674</u>	<u>\$24,481</u>	<u>\$27,876</u>

\* Represents net revenues from production after deducting royalty payments of 15 per cent from the gross well-head value of all production as reported by the Bureau of Mines.

TABLE I

**ESTIMATED EXPENDITURES FOR EXPLORATION, DEVELOPMENT, AND PRODUCTION  
OF OIL AND GAS IN THE UNITED STATES, 1971-1975**  
(Millions of Dollars)

	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>
<b>1. Exploration:</b>					
a. Drilling and Equipping Exploratory Wells	\$ 775	\$ 910	\$ 1,021	\$ 1,647	\$ 2,290
b. Acquiring Undeveloped Acreage	642	1,722	3,646	5,659	1,679
c. Lease Rentals and Exp. for Carrying Leases	143	142	155	186	215
d. Geological and Geophysical	361	372	429	640	702
e. Contributions Toward Test Wells	24	35	38	34	39
f. Land Dept., Leasing, and Scouting	100	105	102	117	141
g. Other incl. Direct Overhead	142	147	181	231	302
h. G & A Overhead Allocated to Exploration	206	239	293	387	403
i. Total Exploration	<u>2,393</u>	<u>3,672</u>	<u>5,865</u>	<u>8,901</u>	<u>5,779</u>
<b>2. Development:</b>					
a. Drilling and Equipping Development Wells	1,573	1,869	2,016	2,686	4,234
b. Lease Equipment	388	497	524	770	1,323
c. Improved Recovery Programs	323	310	276	399	556
d. Other incl. Direct Overhead	185	160	189	349	418
e. G & A Overhead Allocated to Development	202	257	250	272	452
f. Total Development	<u>2,671</u>	<u>3,093</u>	<u>3,255</u>	<u>4,476</u>	<u>6,983</u>
<b>3. Production:</b>					
a. Production Expenditures incl. Direct Overhead	2,504	2,563	2,792	3,508	4,246
b. Production or Severance Taxes	587	613	683	1,209	1,329
c. Ad Valorem Taxes	295	269	275	384	489
d. G & A Overhead Allocated to Production	465	467	485	584	619
e. Total Production	<u>3,851</u>	<u>3,912</u>	<u>4,235</u>	<u>5,685</u>	<u>6,683</u>
<b>TOTAL EXPENDITURES</b>	<u>\$8,915</u>	<u>\$10,677</u>	<u>\$13,355</u>	<u>\$19,062</u>	<u>\$19,445</u>

\* Exclusive of federal, state, and local income taxes, payment of interest, payments for the retirement of debt, and payments to owners as a return on investment.

**APPENDIX**

**1975 Joint Association Survey — Section II  
Questionnaire and Instructions**

**JOINT ASSOCIATION SURVEY QUESTIONNAIRE** 7  
**SECTION II 1975**

Name of Reporting Company \_\_\_\_\_

Code Number \_\_\_\_\_

Individual Submitting Report \_\_\_\_\_

**CONFIDENTIAL**

**JOINT ASSOCIATION SURVEY — SECTION II 1975**

**A. PRODUCTION AND REVENUE — UNITED STATES OIL AND GAS OPERATIONS**

See Attached Instructions

Code Number \_\_\_\_\_

	Volume	Value (Nearest Dollar)
1. Crude Oil and Lease Condensate	_____ Bbls	\$ _____
2. Natural Gas Sales (Premium base _____ psia, at 60° F)	_____ MCF	\$ _____
3. Lessee's Share of Liquids Recovered from Cycling Operations and/or under Processing Type Contracts	_____ Bbls	\$ _____
4. Oil and Gas Royalty Revenue	XXXXXXXXXXXX	\$ _____
5. Other Lease Revenues from Producing Operations	XXXXXXXXXXXX	\$ _____
6. Total Revenues from Petroleum Producing Operations (Sum of Lines 1, 2, 3, 4, 5)	XXXXXXXXXXXX	\$ _____

**B. EXPLORATION, DEVELOPMENT, AND PRODUCTION EXPENDITURES**

**FOR UNITED STATES OIL AND GAS OPERATIONS**

(Whether Capitalized or Expensed)

	Value (Nearest Dollar)
1. Exploration Expenditures	
a. Expenditures for Drilling and Equipping Exploratory Wells (Including Platform Costs)	\$ _____
b. Expenditures for Acquiring Undeveloped Acreage	\$ _____
c. Lease Rentals and Other Expenditures for Carrying Leases	\$ _____
d. Geological and Geophysical Expenditures	\$ _____
e. Contributions Toward Test Wells	\$ _____
f. Land Department, Leasing, and Scouting Expenditures	\$ _____
g. Other Exploration Expenditures (Including Direct Overhead)	\$ _____
h. Total Exploration Expenditures	\$ _____



## 2. Development Expenditures

- |   |          |
|---|----------|
| a. Expenditure for Drilling and Equipping Development Wells<br>(Including Platform Costs) | \$ _____ |
| b. Lease Equipment Expenditures   | \$ _____ |
| c. Expenditures for Fluid Injection and Improved Recovery Programs                        | \$ _____ |
| d. Other Development Expenditures (Including Direct Overhead)                             | \$ _____ |
| e. Total Development Expenditures   | \$ _____ |

## 3. Production Expenditures

- |  |          |
|--|----------|
| a. Production Expenditures (Including Direct Overhead) | \$ _____ |
| b. Production or Severance Taxes                       | \$ _____ |
| c. Ad Valorem Taxes                                    | \$ _____ |
| d. Total Production Expenditures                       | \$ _____ |

## 4. General and Administrative Overhead Not Reported Elsewhere

- |                             |          |
|-----------------------------|----------|
| a. Allocated to Exploration | \$ _____ |
| b. Allocated to Development | \$ _____ |
| c. Allocated to Production  | \$ _____ |
| d. Sub Total (Lines b & c)  | \$ _____ |
| e. Total (Lines a & d)      | \$ _____ |

## 5. Total Expenses (Sum of lines 1b, 2e, 3d, and 4e)

\$ _____
----------

## 6. Expenditures for Drilling and Production Platforms (Memorandum Only)

- |                         |          |
|-------------------------|----------|
| a. Drilling Platforms   | \$ _____ |
| b. Production Platforms | \$ _____ |
| c. Total (Lines a & b)  | \$ _____ |

## JOINT ASSOCIATION SURVEY—SECTION II

9

## NOTES AND INSTRUCTIONS

## GENERAL:

Section II of the Survey supplements the information in Section I. It includes not only expenditures for drilling and equipping wells, but also all other expenditures incident to finding, developing, and producing oil and gas in the United States. It should be noted, however, that all net working interest expenditures should be reported, whether for operated or non-operated properties. Expenditures should be reported only by those directly engaged in drilling and producing operations. Do not report expenditures or revenues applicable to gas processing plants or gas systems.

The revenues included in this Section include primarily the receipts (after royalty payments, production payment disbursements, and net profit disbursements) from their net company interest in oil and gas production recorded in the books of account in the calendar year. Also included are certain non-operating revenues from other sources, such as from royalty interests, net profit interest receipts, production payment receipts, etc., earned in productive properties. On the other hand, receipts of royalty owners not directly engaged in drilling and production are excluded from reported revenues.

In order that the information gathered shall be on a comparable basis, each reporting company is requested to report its total net working interest expenditures as outlined below. Report only the expenditures recorded on the books of account (whether actually paid or accrued) in each category during the calendar year 1975. Report all such relevant expenditures, whether incurred for current expenses or on capital account. Include in overhead items only those resulting from cash expenditures during the year. Exclude non-cash items such as depletion, depreciation, and amortization, etc., except that in General and Administrative Overhead, item B-4, depreciation may be charged for office buildings, etc. (where the total cash expenditure for such facilities are not reported elsewhere).

**Definitions:** "Casinghead gas" or "percentage" type contracts as used herein apply to an arrangement whereby the lease owner sells raw gas (measured in MCF) to a gas processing plant. The amount received by the lease owner under this type of contract is usually based on a percentage of the value of the residue gas sold plus an additional amount for the value of the additional product (including sulfur) content of the gas.

A "processing" type contract as used herein is an arrangement whereby the lease owner furnishes gas to a plant for processing, retaining title to the residue gas remaining after processing. The processing is performed for a fee or a settlement solely out of the products extracted with the lease owner retaining the remainder of the product (including sulfur) proceeds.

The following detailed instructions are numbered to correspond with the item numbers on the questionnaire form.

## A. PRODUCTION AND REVENUE—UNITED STATES OIL AND GAS OPERATIONS

## A-1. Crude Oil and Lease Condensate

Report the net company working interest in crude oil and lease condensate produced. The volume should be the net company working interest in liquids produced from all wells in which all or part of the working interest is owned, including unleased prospects. The volume reported should not include liquid products derived from gas processed under casinghead or percentage type contracts, from cycling operations and/or under processing type contracts.

The value reported should be the amount of revenue credited to the lease (after royalty payments, production payment disbursements, and net profit disbursements). Do not include the lease sales value of liquid products derived from gas processed under a casinghead or percentage type contract, which is to be reported in Item A-2, or from cycling operations and/or under processing type contracts which is to be reported under A-2 or A-3 depending on the basis recorded in company accounts. Do not deduct production or severance taxes since these should be reported as expenditures in Item B-3-b.

## A-2. Natural Gas Sales

## Volume

Report the volume of net company working interest in gas produced from oil and gas wells, and subsequently sold, including:

(1) The volume of gas delivered to respondent's own gas processing plants or gas systems. For cycling operations and/or under processing type contracts, if the sale of residue gas and liquid products is recorded on a separate basis, report only the lesser share of the net company working interest in residue gas sold by the plant. If recorded on a raw gas basis, as under a casinghead contract, report the net working interest raw gas volume.

(2) The volume of gas used in drilling or producing operations, if the value of such gas is credited to lease revenue with a corresponding charge to lease operations.

## Exclude the following:

(1) The volume of residue gas sold (or returned for lease operations) where such residue gas (or proceeds therefrom) represents all or part of the consideration received from the sale of casinghead gas, as under a casinghead or percentage type gas contract. (The inclusion of residue gas volume would amount to duplication, since residue volume is included in the volume of raw gas sold to the gas processing plant.)

(2) The volume of gas returned to the producing reservoir.

The volumes reported should be at the pressure base reflected in the accounts of the reporting producer, and such volumes need not be adjusted to any uniform pressure base, such as 14.65 psi. However, please record the pressure base used in the space provided.

## Value

The value of net company working interest in gas produced from oil and gas wells and credited to lease revenues should include:

(1) Revenue received from sale of gas. This value should include (a) the revenue derived from the sale of liquid and residue gas extracted from gas processed under casinghead or percentage type contracts, and (b) the revenue received from the sale of residue gas from cycling operations or under processing type contracts if so recorded in company accounts. If recorded on a raw gas basis, report the revenue from both residue gas and liquids.

(2) The value of gas delivered to respondent's own gas processing plants or gas systems which is credited to the lease.

- (3) The value of gas used in drilling or producing operations, including residue gas returned from plants, if the value of such gas is credited to lease revenue with a corresponding charge to operations.

**A-3. Lessee's Share of Liquids Recovered from Cycling Operations and/or under Processing Type Contracts**

Report the lessee's share of the net company working interest in the volume and value of liquids recovered from cycling operations and/or under processing type contracts, if recorded separately on company records. If not separated, report the volume and value of the lessee's share of liquids sold from such operations (on a raw gas basis) under item A-2.

**A-4. Oil and Gas Royalty Revenue**

Report oil and gas revenue from royalties owned plus interest from oil payment interests received, net profit interests received, etc.

**A-5. Other Lease Revenues from Producing Operations**

Report any other lease revenues strictly incidental to oil and gas operations, such as equipment rentals; receipts from services performed for others; sales of water or steam; etc. Do not include revenue attributable to operations of gas processing plants or gas systems, or receipts from sale of assets, producing properties, etc. Do not include revenue applicable to mined sulfur, oil, shale, uranium, or other mineral operations.

**B. EXPLORATION, DEVELOPMENT, AND PRODUCTION EXPENDITURES FOR UNITED STATES OIL AND GAS OPERATIONS (Whether Capitalized or Expensed)**

In this section, the classification of exploratory and development well expenditures should be based on the AAGP well classifications as used in Section I, as follows:

- (1) Exploratory wells which include new-field wildcats, new-pool wildcats, deeper-pool tests, shallower-pool tests, and outposts (extensions).

- (2) Development wells which are those wells drilled to produce oil or gas from pools discovered by previous drilling.

Report only expenditures for the company's net working interest, whether for company operated or non-operated properties. Report expenditures for dry holes as exploratory or development (under B-1-a or B-2-a) in accordance with the above classification. Because service wells do not fall necessarily within any one category of expenditures, see definitions below (B-2-c and B-2-d) for treatment of expenditures for service wells.

Exclude expenditures incidental to mined sulfur, oil shale, uranium, or other mineral operations.

**B-1-a. Expenditures for Drilling and Equipping Exploratory Wells (Including Platform Costs)**

Report all expenditures (reduced by the amount of outside cash contributions such as bottom hole or dry hole) for drilling exploratory wells including successful wells completed, dry holes, and wells still drilling at end of the year. Include: (a) expenditures for casing, tubing, and wellhead fittings associated with exploratory wells, (b) expenditures for roads, grading, etc., (c) expenditures for drilling platforms, and all other expenditures incidental to exploratory drilling. Reduce cost of exploratory dry holes by salvage of equipment capable

of reuse. Exclude all expenditures for equipment beyond the Christmas tree and expenditures for all downhole pumping and artificial lift equipment which should be reported in B-2-b.

**B-1-b. Expenditures for Acquiring Undeveloped Acreage**

Report expenditures incurred during the year for acquiring undeveloped acreage including lease bonuses, advance initial rentals which because of unusual circumstances are actually in the nature of a bonus, and any other outlays necessary to acquire leases, mineral rights, and fee lands incidental to oil and gas exploration. Exclude annual rentals and other lease-carrying expenditures which should be reported under item B-1-c.

**B-1-c. Lease Rentals and Other Expenditures for Carrying Leases**

Report expenditures made during the year for lease rentals and other expenditures for carrying leases, such as shut-in royalties and annual payments. Omit land department, leasing and scouting expenditures, which should be reported under item B-1-f.

**B-1-d. Geological and Geophysical Expenditures**

Report all expenditures for geological and geophysical exploration. Include expenditures for capital equipment identifiable with G & G and for core drilling (such as some types of slim hole stratigraphic tests) where the intention in advance of drilling is not to complete the well as a producing well, and/or when such tests are drilled in such a manner that productive completion is not possible.

**B-1-e. Contributions Toward Test Wells**

Report all contributions toward test wells, including dry hole money, bottom hole money, etc. Do not include the cost of acreage contributions.

**B-1-f. Land Department, Leasing, and Scouting Expenditures**

Report all land department, scouting, and lease acquisition expenditures except the actual outlays for purchase or land leasing reported under items B-1-b and B-1-c above.

**B-1-g. Other Exploration Expenditures (Including Direct Overhead)**

Report all expenditures not listed above, which relate to exploration for oil and gas, whether such expenditures are capitalized or expensed on the books of account. Include expenditures for exploratory capital equipment constructed or purchased, not included in B-1-a through B-1-f above. Include direct overhead, especially at district and field levels, where such overhead can be identified with the exploratory function: e.g., district supervisory salaries; ad valorem taxes on non-producing leases; and taxes on buildings and equipment used for exploratory purposes. Report exploration overhead costs which cannot be directly identified with exploratory activities undertaken during the year under B-4. Exclude all exploratory outlays not specifically devoted to oil and gas operations such as for mined sulfur, oil shale, uranium, or other minerals.

**B-2-a. Expenditures for Drilling and Equipping Development Wells (Including Platform Costs)**

Report all expenditures for drilling development wells including successful wells completed, dry holes, and wells still drilling at end of the year. Include: (1) expenditures for casing, tubing, and wellhead fittings associated with development wells, (b) expenditures for roads, grading, etc.,

(c) expenditures for drilling platforms, and all other expenditures incident to development drilling. Exclude all expenditures for equipment beyond the Christmas tree and all expenditures for downhole pumping and artificial lift equipment which should be reported under B-2-b.

#### B-2-b. Lease Equipment Expenditures

Report all lease equipment expenditures beyond the Christmas tree installation, including flow lines, flow tanks, field separators, heater-treaters, production platforms, and related field facilities. Include expenditures for all normal pumping and other artificial lift equipment, including downhole installations, required for primary production.

#### B-2-c. Expenditures for Fluid Injection and Improved Recovery Program

Fluid injection and improved recovery programs include gas injection, water injection, steam injection, miscible phase, in situ combustion, etc., associated with oil and gas production. Report expenditures for procuring and installing all facilities and for drilling service wells, or converting existing wells to service wells, associated with such programs. Facilities should include pumps, compressors, engines, tankage, gathering and injection lines, treating facilities, special downhole and surface equipment, etc. Service wells include wells used for gas injection, water injection, steam injection, air injection, and water supply for injection. Do not include expenditures for observation wells, salt water disposal wells, water supply wells, or other wells required for primary production operations which should be reported under Item B-2-d.

#### B-2-d. Other Development Expenditures (Including Direct Overhead)

Report all other development expenditures, including such items as access facilities to district installations (as opposed to individual wells) such as roads, bridges, canals, and other improvements, camp and district facilities; fuel gas systems; observation wells, salt water disposal wells; and water supply wells other than reported under B-2-c, directly assignable overhead expenditures; and expenditures for capital equipment used for development not otherwise accounted for. Exclude expenditures for equipment and buildings used by personnel engaged in general producing and administrative activities as distinguished from development operations.

Report overhead expenditures which cannot be directly identified with development activities during the year under Item B-4. Also exclude expenditures for development not specifically devoted to oil and gas operations, such as for mined sulfur, oil shale, uranium, or other minerals.

#### B-3-a. Production Expenditures (Including Direct Overhead)

Report lifting expenditures and all other expenditures which are directly applicable to the production of oil and gas, as distinguished from exploratory and development activities. Include expenditures for labor, supervision in the field, repairs and maintenance including workovers; fuel; power and water; small tools and supplies; cost of treating oil; teaming and trucking; insurance; taxes (not including production and ad valorem taxes, and federal and state income taxes); baiting, shooting, fracturing, and acidizing, when not part of original completion work; abandonments, and expenditures for

maintaining field offices. Include direct overhead, especially at district and field levels, where such overhead can be directly identified with the production function. Do not include expenditures applicable to gas processing plants or gas systems.

#### B-3-b. Production or Severance Taxes

Report here the total payments for production or severance taxes to state and local governments. Do not reduce the value of crude oil and natural gas produced at the wellhead by such amounts.

#### B-3-c. Ad Valorem Taxes

Report expenditures for ad valorem taxes on producing properties or equipment thereon, buildings, lease or field facilities, and other property used in production operations. Exclude ad valorem taxes on undeveloped properties and property taxes on buildings and equipment used for exploratory purposes, which should be included in Item B-1-g; ad valorem taxes on office buildings or other facilities used for general and administrative purposes, which should be included under Item B-4 to the extent that they are applicable to the operations covered by this report.

#### B-4. General and Administrative Overhead Not Reported Elsewhere

Report all general operating and administrative expenditures above the field level, which are applicable to exploration, development, and production activities, excluding only those items which have been directly classified under Items B-1-g, B-2-d, and B-3-a. Include salaries and office expenditures and depreciation charges for office buildings, etc. (Note: including such depreciation is in accordance with the instructions set forth under General Notes for reporting expenditures.) If engaged in activities other than the production of oil and gas, include under this heading only that portion of general and administrative expenditures allocable to the oil and gas exploration and production departments. Do not include interest on investment or state and federal income taxes.

General and administrative overhead reported in total under Item B-4-a may be distributed to exploration (B-4-a), development (B-4-b), and production (B-4-c), in accordance with company practice. If allocations are customarily made between exploration and production functions, but not between development and production, the total of development and production may be entered under B-4-d. If allocations are not customarily made, such allocations are optional.

#### B-6. Expenditures for Drilling and Production Platforms (Memorandum Only)

Report total expenditures during the year for drilling and production platforms, whether such platforms were located on inland waters or offshore. Platform expenditures were included in Section I on the basis of allocation of pertinent expenditures among currently completed wells. In Section II drilling platform expenditures should be included as expenditures for drilling and equipping exploratory and development wells under Items B-1-a and B-2-a. Expenditures for production platforms should be included under Item B-2-b. However, expenditures for drilling platforms and production platforms also should be reported under Items B-6-a and B-6-b for memorandum purposes.

**Effective  
Income Tax Rates  
Paid by  
United States  
Corporations in 1972**

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**Office of Tax Analysis  
Department of the Treasury  
May 1978**

Preface

This publication of estimated effective income tax rates paid by U.S. corporations in 1972 is an outgrowth of work initiated in December, 1975 at the joint request of the Chairmen of the Joint Economic Committee and the Senate Select Committee on Small Business, Pursuant to that request, and following a meeting among interested parties, a Steering Committee comprised of representatives of the aforementioned Committees, along with others from the Joint Committee on Internal Revenue Taxation and the Federal Trade Commission, was established to help guide the Treasury in its assembly of information, the decision having been reached that tax return data afforded the best source of income and tax measures.

Through the course of this endeavor, the Treasury staff have benefitted from the exchange of views and technical assistance made possible by this arrangement. Needless to say, the Treasury is wholly responsible for the content of this report. The release of this report to the Congress and the public is made in the interest of furthering understanding of the difficulties and ultimate ambiguities in the construction and interpretation of effective tax rates.

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## I. Introduction.

There is a persistent popular interest in "effective tax rates" paid by two classes of income taxpayers, persons and corporations. There is also widespread misunderstanding about the ambiguities of effective tax rate computation. This report is concerned only with corporation income taxes and is intended to shed light on the taxability of income, by size of corporation and by industrial class, and to set out logical rules for the construction of effective tax rates.

The data relied upon here for measures of income and of its taxability have been derived from individual corporation income tax returns selected by the Internal Revenue Service for statistical processing and for reporting in its annual publication, Statistics of Income: Corporation Income Tax Returns, 1972. For this report, foreign income and tax items from Form 1118 not included in the IRS publication have been extracted and collated with the previously published tax return information. The asset size classification employed in this report also differs from that in Statistics of Income. Here the total assets of a corporation as reported

in its tax return, and which are the basis for size classifications in Statistics of Income, have been adjusted by netting-out trade credit to better represent assets actually employed in its business by the corporation.<sup>1/</sup>

## II. Effective Tax Rates, 1972; Nonfinancial Corporations.

An "effective tax rate" is simply the ratio of some measure of "taxes paid" to some measure of before-tax "income." Much mischief may be done in such a computation by mismatching of the numerator and denominator. The denominator, being an income measure, is generally computed on the basis of accrual rules: the "income" of a year is determined by elaborate accounting procedures which attempt to match the costs of earning the sales receipts during a

<sup>1/</sup> If accounts and notes receivable exceed accounts and notes payable, the latter is subtracted from both sides of the balance sheet. In this case, the net trade credit extended is capital employed which must be financed by long-term debt and equity. If accounts and notes payable exceed receivables, the receivables are subtracted from both sides of the balance sheet. The excess of payables is then a source of finance for the remaining assets employed in the business.

year, regardless of the timing of actual revenues or expenditures. On the other hand, "taxes due" is basically a "cash accounting" concept under which only the net liability for tax due to the U.S. Treasury during a year is customarily accounted for. If the use of the tax account to clear other years' transactions, such as refunds, is neglected, "taxes due" becomes inappropriate as a measure of tax liability generated by the "income" shown in the denominator.<sup>2/</sup> Moreover, "income" reported and used as the denominator of an effective tax rate calculation for U.S. taxpayers is invariably worldwide income, for the Internal Revenue Code subjects to tax income from all sources, both foreign and domestic. Obviously, if only the net tax due the U.S. Treasury is shown in the numerator while worldwide income taxes is shown in the denominator, there is an overt understatement of the taxability of any taxpayer with worldwide income.

<sup>2/</sup> To illustrate the pitfalls of dealing with cash payments of tax relative to incomes that have generated tax liability, consider that many taxpayers finish paying their tax liability for a given year sometime during the first third of the succeeding year; other taxpayers overpay their tax liability during a given year and receive a refund the following year. In either case, the taxpayer's "effective" tax rate for the given year is the tax liability generated by his income for that year, divided by the year's income not the taxes actually remitted.

Indeed, failure to consistently match numerator and denominator is entirely responsible for the common misconception that "small businesses" pay higher tax rates than "big business." The following sequential presentation of various ways of computing "effective tax rates" is intended to put to rest this misrepresentation of fact.

A. Misrepresentation of effective tax rates due to improper aggregation of corporations.

In 1972 more than 1.6 million nonfinancial corporations filed income tax returns (see Row I(a) of Table 1).<sup>3/</sup> Altogether, these nonfinancial corporations reported \$75.15 billion of taxable income, as measured by the rules of the Internal Revenue Code and from all sources, domestic and foreign. In the tables, this measure of income is referred to as "basic worldwide taxable income" (BWTI). On the basis of BWTI of \$75.15 billion, nonfinancial corporations owed

<sup>3/</sup> Financial corporations, banks, insurance companies, investment companies, etc., are not reported as a group because size classifications among these heterogeneous enterprises have little meaning. In the case of insurance companies, the measure of taxable income provided in the Internal Revenue Code is so highly specialized it cannot be adjusted to reflect normal concepts of enterprise income; and in the case of investment companies, if they elect to operate as regulated holding companies and distribute currently at least 90 percent of their before tax income, they are not subject to corporation income tax. Banks (commercial and savings), on the other hand, do report income and other data which permit a sensible approximation of before tax income and corresponding tax liability. Thus, while banks are excluded from the figures reported in this section, they will be reported as an industry category in the next.

net income tax to the Treasury, after all credits, of \$29.13 billion. These figures yield an apparent effective tax rate of 38.8 percent overall, the rates ranging from infinity for the smallest size class, which reported a net loss of \$253 million while owing \$211 million in tax, to 29 percent for the very largest. The occurrence of "effective tax rates" computed from BWTI in excess of 48 percent, the maximum statutory rate on taxable corporate income in 1972, is a clear indication that something is amiss in this calculation. The reasons for these incongruous results are that corporations have been aggregated which do not permit comparisons of income and tax liability for the same year.

Corporations reporting losses. Large numbers of corporations, particularly those at the small end of the size spectrum, will frequently report negative taxable income (losses) in a given year. Algebraically adding negative and positive incomes produces a smaller total income in the denominator of effective tax rate calculations; indeed, as we have seen, the smallest corporations in the aggregate report more losses than gains. But, since the tax returns of loss corporations do not show the refund, or "negative tax" for the year due to the net operating loss carryback or carryover, the aggregate "tax due" in the numerator of the effective tax rate calculation is undiminished. The net

result is that we have incomparable numbers in the numerator and denominator of the effective tax rate calculation that produce overstatements of apparent effective tax rates.

Corporations not subject to tax. Certain corporations may elect to be taxed essentially as partnerships under provisions of Subchapter S of the Internal Revenue Code. Some of these corporations report losses, others positive taxable incomes; but although their BWTIs are (algebraically) included in the denominator of the effective tax rates we have just reviewed, their tax liabilities are never in the numerator.<sup>4/</sup> Their inclusion in the calculation necessarily confuses the meaning of corporation effective tax rates. Similarly domestic international sales corporations (DISCs) file income tax returns but are not, directly, subject to income tax. Instead, half their income is taxable to parent corporations. Obviously DISCs should not be included as separate corporations; rather they should be consolidated with their parents.

<sup>4/</sup> Subchapter S corporations may generate corporate tax liability in connection with certain capital gain transactions, but this is invariably a trivial amount of tax.

Result of reclassification. The dramatic effect of careful aggregation may be observed by comparing Sections I and II of Table 1. In Section II, corporations without BWTI, those electing to be taxed under Subchapter S, and DISCs have been eliminated.<sup>5/</sup> For nonfinancial corporations, this has involved dropping nearly 900,000 corporate entities, but ~~increasing~~ BWTI by more than \$9 billion. As a consequence, the overall effective tax rate is reduced to 34.5 percent, and the range of "effective tax rates" now begins to approximate the statutory rates prevailing in 1972, 22 percent on taxable income up to \$25,000, 48 percent on the excess. <sup>6/</sup>

<sup>5/</sup> Although DISCs were excluded, they were "statistically" consolidated with their parent corporations by doubling DISC dividends reported by parent corporations. Because DISC dividends reported by parent corporations may refer to prior years, this procedure tends to understate DISC income of the parents, taxation of which is deferred, particularly in 1972 when DISC formation was rapid due to novelty of the program.

<sup>6/</sup> Exclusion from the tabulation of corporations without taxable income for 1972 in order to maintain comparability of numerators and denominators in effective tax rate calculations has no effect on results if, and only if, tax losses are ultimately refunded. If some losses in 1972 are never requited by carry-back or -forward to other years, then these losses should be retained in 1972 denominators. And if these losses were retained, the 1972 effective tax rates would be slightly elevated. Unfortunately, there is presently insufficient empirical evidence on which to base an estimate of the amounts of any year's reported losses which will not generate a refund.

B. Improving the content and better matching of numerator and denominator.

To this point, we have continued to use U.S. tax due, after credits, in the numerator of the effective tax rate calculation and BWTI in the denominator. This is clearly unsatisfactory. So long as any measure of worldwide income is used in the denominator, worldwide taxes should be included in the numerator. More importantly, the denominator in the calculation is taxable income and we are all aware that this magnitude is overtly understated for tax purposes as a device to subsidize particular economic activities engaged in by corporations--and unincorporated enterprises as well. Moreover, the tax accounts are used to clear refunds pertaining to other years' transactions, a source of distortion which must be removed.

(1) Adjustments to income (denominators):

Restoration of preferential deductions. Subsidies are provided certain specific economic activities in the form of special deductions from gross income in arriving at taxable



income. Among those available in 1972 we might list:<sup>7/</sup>

(a) Special 5-year amortization privileges, in lieu of normal tax depreciation deductions, for childcare facilities, railroad rolling stock, rehabilitation of low- and moderate-income housing, coal mining safety equipment, and pollution control investment;

(b) Percentage depletion allowances for production of minerals, including oil and gas;

(c) A special deduction for U.S. corporations at least 90% of whose gross income originated in trade outside the United States, but within the western hemisphere.

Clearly, the excess of these deductions over those which would be regularly allowed in the measurement of pre-tax

<sup>7/</sup> In addition to the preferential deductions listed which apply generally to financial and nonfinancial businesses, are those extra "bad debt" deductions allowed commercial banks and thrift institutions. The effect of bad debt deductions is dealt with in the following section presenting effective tax rates for banking.

income is merely an intentional understatement of taxable income. The excess of these deductions should be restored if the denominator in an effective rate calculation is to substantially represent a corporation's (or any taxpayer's) before-tax income for the year.<sup>8/</sup>

<sup>8/</sup> Due to the existence of the minimum tax on preferences, it was possible to identify the magnitudes of these excesses of preferential deductions which might be restored to income for 1972. The minimum tax generated by these preferences, if any, is already included in the U.S. tax element of the numerator. Another significant preference for which no adjustment to the income denominator could be made is the expensing of intangible drilling costs and related preferential treatment of exploration costs for other minerals activities. For these preferences the necessary data, taxpayer by taxpayer, are totally lacking in tax return records.

A case could be made that at least part of the ordinary allowances claimed for depreciation are preferential in that they are in excess of the amounts that would be required to measure income appropriately. This has been particularly documented in the case of tax depreciation allowances for real property. However, this study has generally not attempted to adjust reported deductions for tax depreciation due to the unavailability of sufficiently detailed information on the tax return. Nevertheless, preferences for "accelerated depreciation" deductions taken with respect to certain properties subject to a net lease and which are also part of the minimum tax base have been added back to taxable income.

Restoration of excluded income. Many corporations hold bonds issued by state and local governments the interest on which is exempt from tax. By law, this interest income is excluded from the holders' taxable incomes. Restoration of this exclusion to income yields a better measure of before tax income for the year.<sup>9/</sup>

(2) Adjustments to taxes (numerators):

Foreign taxes. Under longstanding international conventions observed by the United States, foreign governments are accorded the "first chance" to tax income of U.S. corporations earned within their political jurisdictions. Mechanically, this is accomplished by requiring U.S. corporations to report as taxable income in their U.S. tax returns the income they earn abroad (but in the case of foreign subsidiaries, only when dividends are remitted to the parent), to compute U.S. tax which would be due on that income, and then take as a credit against this tax otherwise due the amount of tax paid to foreign governments.

<sup>9/</sup> It should be noted that this mode of correction for the exclusion of tax-exempt interest exaggerates the effect of this subsidy to state and local government debt financing in reducing "effective tax rates" of holders of these securities. See discussion of this point in Section IV,

If foreign taxes paid are less than the amount computed under U.S. tax laws, the difference must be paid to the Treasury. If foreign taxes paid exceed U.S. tax liability, the excess may be carried back or forward to other years to be credited against U.S. tax liability, but only against the U.S. tax attributable to foreign source income. Clearly, if worldwide income appears in the denominator, worldwide taxes generated by that income, both those paid abroad and to the Treasury, should appear in the numerator.<sup>10/</sup>

Effect of loss carryforward. In any year many corporations that had suffered a loss in prior years but were unable to secure a refund because they had insufficient taxable income in the 3 carryback years will obtain their refund by simply deducting a carryforward of unrequited losses against the

<sup>10/</sup> Foreign income taxes restored to the numerator are those reported in Form 1118 as taxes paid and accrued and deemed paid.

otherwise taxable income of the current year. This is an eminently sensible and efficient way to accomplish the refund: it avoids the payment of all its current year's tax by such a corporation to be followed by application for a refund. Clearly, then, the deduction from this year's taxable income of a loss carryforward leads to an understatement of this year's pre-tax income and should be restored. Similarly, exclusion from tax due of the amount refunded with respect to the loss carryforward is an understatement of tax generated by this year's income; this, too, should be restored. This adjustment parallels the adjustments for current year's losses described above.

(3) Effective tax rates after adjustments.

Section III in Table 1 shows the outcome of making these necessary adjustments to the numerator and denominator of the effective tax rate calculation. On the one hand, expanding BWTI to include overt understatements and exclusions has added nearly 120,000 nonfinancial corporations to the tabulation and has increased the denominator (income) by over \$9 billion. On the other hand, restoration of refunds due to prior year losses and inclusion of foreign income taxes paid and deemed paid has added \$9 billion to the nonfinancial corporations' numerator (taxes). As a consequence, the 1972

effective tax rate for all nonfinancial corporations becomes 40.9 percent, 6.4 percentage points higher than before. There is also apparent now a clear upward progression of effective tax rates by size of corporation.11/

It is noteworthy that the adjustments to tax and income involved in going from Section II to III have little impact on computed effective tax rates of corporations at the low end of the spectrum but a large impact on those at the high end. This is not unexpected: smaller corporations rarely have foreign income and tax and they less frequently engage in the kinds of economic activities favored by preferential deductions or exclusions from taxable income. Their major preference (in 1972) is the \$25,000 exemption from surtax which holds their effective tax rates near the 22 percent normal tax level.

11/ The high effective tax rate in the over \$1 billion asset class is due to the peculiar problems associated with foreign taxes reported by oil companies. See the discussion of that industry's effective tax rate in the section following.

The Section III figures are recommended as the best single indicator of effective tax rate because the numerators (worldwide taxes) and denominators (worldwide income) are most closely matched. However, Sections IV and V of Table 1 present separate computations of domestic and foreign effective tax rates. The domestic income effective tax rates in Section IV were derived by subtracting taxes paid foreign governments from worldwide taxes to obtain the numerator of the ratio and by subtracting foreign source income from worldwide income to obtain the denominator. This leaves in the numerator some tax attributable to foreign source income and causes the effective tax rates on U.S. income to be slightly overstated. Similarly, the foreign source income effective tax rates in Section V involve some mismatching of numerators and denominators, since the former does not include some taxes paid the U.S. Treasury with respect to some of the before-tax income included in the denominator. This causes a slight understatement of these effective tax rates. Nevertheless, the following observations are warranted:

- Whether with respect to domestic or foreign source pre-tax income, effective tax rates rise with income. In the case of domestic income, the drop-off of the U.S. effective tax rate in the \$1 billion and over asset class, from 40.7 in the preceding class to 37.7, is accounted for entirely by the dominance of utilities and companies with mineral income in that largest size class, as will be evident in the industry breakdowns to be reviewed below.
  
- Although the taxability of foreign source corporate income appears to be substantially above domestic rates, 56.1 as compared with 37.8, this appearance is due almost entirely to the confounding of oil taxes and other payments to host countries. When the oil company foreign income and tax items are eliminated, the effective foreign rate is 40.0 percent, only slightly above the U.S. effective rate on domestic income.



### III. Effective Tax Rates, by Industry.

Reference has already been made to a number of causes for the departure of effective tax rates from those specified in the Internal Revenue Code. Over the years, remission of tax has been used as a means for effecting non-revenue Federal policy objectives. We have noted the several preferential deductions from pre-tax income to arrive at taxable income; when these are restored to better measure before tax income, effective tax rates fall. Additionally, two credits against income tax otherwise due that year were available in 1972. One was a 7 percent investment credit (4 percent for regulated utilities) for the purchase of certain kinds of depreciable assets; the other was a credit of 20 percent of certain expenses incurred in the employment of welfare recipients (usually unemployed mothers with dependent children), commonly referred to as the "work incentive program" (WIN). Since both these subsidies are paid via a reduction of tax otherwise due, the earning of these subsidies naturally reduces the numerator in effective rate calculations and, hence, apparent effective tax rates.

The magnitude of the effect of clearing subsidies through the tax system on computed effective tax rates among industries will depend on the degree to which the activities

subsumed in the industries are favored by tax subsidies. Moreover, most of these subsidies are capital related, i.e., in the form of extra deductions connected with the acquisition and use of certain kinds of equipment, or as an investment credit for other kinds of capital equipment. Consequently, they tend to be of relatively less importance to smaller businesses, for, in any industry, small businesses are typically more labor, less capital, intensive. Tables 2 (for worldwide income) and 3 (domestic income) illustrate these differentials in tax subsidies by type of activity and size of enterprise.

In Table 2, effective worldwide tax rates for corporations in 19 industries are listed in descending order of tax rate. The highest industry tax rate, 59.4 percent, is that for corporations engaged in all stages of the petroleum and natural gas industries, except natural gas distribution; the lowest worldwide tax rate is that for banking, 19.4 percent. The low rank of banking simply reflects the magnitude of their tax subsidy in the form of artificial bad debt deductions and their institutional capacity to hold bonds yielding tax-exempt interest.

However, as noted earlier, the petroleum and natural gas worldwide effective tax rate is swollen by the ambiguous character of most of the payments they are required to pay host countries: since the host country is both the taxing power and the original owner of the mineral resources, the host country is able, under its tax laws, to extract from oil companies a share of the companies' income from oil and gas discovery that, in a property system like that of the United States, would accrue to the companies or to co-owners of the mineral rights. Under the tax laws and regulations prevailing in 1972, a large volume of these ambiguous "taxes" were regarded as shares of before-tax income paid as taxes and this had the effect of producing a 59.4 percent effective worldwide rate. Since there is no analytical basis for disaggregating oil company payments to foreign governments into those which might legitimately be called an income tax and those that represent an allocation of before tax income

to the mineral owner, we may obtain a more reasonable measure of the taxability of income in this industry under U.S. tax laws by excluding the confounding foreign items from both numerator and denominator. This is done in Table 3. Arrayed by size of effective tax rate on U.S. income, (see Table 3) petroleum and natural gas companies rank 17th among the 19 industry groups with an effective tax rate of 24.7 percent.<sup>12/</sup>

Excepting this difference in ranking in the two tables of effective tax rates, the other industries' rankings are quite stable. "Other manufacturing," which includes the manufacture of motor vehicles, chemicals, electrical and electronic equipment, among others (See Appendix), is subject to the highest rate of tax, 41.9 percent on worldwide income, 42 percent on U.S. source income. The median industry worldwide rate of tax, 33.1 percent, was experienced by the ferrous metals group (iron mining, steel manufacture, etc.); the median tax rate on U.S. source income, 31.6 percent, was experienced by the services industries.

<sup>12/</sup> This effective tax rate does not reflect the benefit of expensing intangible drilling costs of wells that later prove to be productive. As previously noted, the information required to adjust taxable income for this preferential deduction is not available.

Banking is consistently taxed at low rates, 19.4 percent worldwide, 18.6 percent on U.S. source income.

Within industry groups, effective tax rates by size of corporation generally reveal the expected pattern: small corporations experienced lower effective tax rates than did the larger. This may be seen in Tables 2 and 3 by comparing the industry-wide effective tax rates with those in the adjoining column that represent the effective tax rates for all corporations in that industry grouping with less than \$1,000,000 of assets. In Table 2 (worldwide tax rates), small corporations experienced lower effective tax rates than the industry average in each category, save ferrous metals and banking; in Table 3 (U. S. tax rates), the same condition prevails, except in banking alone.

Tables 2a and 3a present the detailed effective tax rates on worldwide and U.S. source income, respectively, by asset size of corporations. The patterns in these latter tables, due to the variance necessarily introduced by smaller numbers in the larger size classes, are far less regular. For example, in Table 3a, the 5 largest corporations in the

nonferrous group experienced an 11.2 percent effective tax rate on U.S. source income because, in 1972, in addition to tax subsidies in the form of percentage depletion allowances in excess of cost (which expands the denominator), these firms earned maximum amounts of investment and WIN credits (which diminish the numerator). Smaller firms in this industry group, being less likely to both engage in mining and to make comparatively large volumes of investment in qualified property, experience lesser reductions from statutory rates.

Nevertheless, except in banking, the two smallest size classes, which overall encompass 75 percent of all corporations subject to income tax, invariably experience effective tax rates well below the industry average in any industry group. In banking the exception to this rule reflects the fact that inclusion of tax-exempt bonds in bank portfolios and the ability to form nonbanking subsidiaries that engage in equipment leasing, and hence earn investment credits, is a function of bank size.

#### IV. Concluding and Precautionary Comments.

The effective tax rate tabulations reviewed in this report are the most comprehensive set of such computations prepared by the Treasury Department. As later years' data become available, they will be processed and published as resources permit. In this first release of such material it is appropriate to add some brief comment on comparisons between these effective tax rates and others which are published from time to time that are derived from corporations' published financial statements. It is also appropriate to conclude this report with some observations on the limitations of effective tax rates as guides to an appraisal of the characteristics of the tax system.

##### A. Comparisons with effective tax rates based on published financial statements.

Effective tax rates here presented have been derived from income tax returns. These will not be directly comparable with superficially similar effective tax rates computed from data extracted from financial statements published by the same corporations for the same year. The reasons for this state of affairs have to do both with

measures of "taxes" in the numerator and of before-tax "income" in the denominator. We may summarize these differences as follows: 13/

(1) Consolidation rules.

The rules for consolidating subsidiaries are different for tax and financial reporting. For tax purposes, the criteria for consolidation include the requirement that only corporations chartered in the United States may be consolidated and that there be ownership by the parent corporation of at least 80 percent of the subsidiaries consolidated. For financial reporting, any corporation wherever chartered may be consolidated by another corporation if the latter corporation maintains at least 50 percent ownership of the former. In general, this means that neither

13/ For a more detailed exposition of the problems in deriving effective tax rates from corporations' financial statements, see Pitfalls in the Computation of "Effective Tax Rates" Paid by Corporations; OTA Paper No. 23; U.S. Treasury Department (July, 1977).



the worldwide tax nor the worldwide income reported on tax returns and financial statements will be the same because the reporting entities do not correspond.<sup>14/</sup> There is no practical way to reconcile these differences.

(2) Income measurement rules.

Since there is no set of universal rules for income measurement, even in those cases where the reporting entity is the same for both tax and financial accounting, before-tax incomes in tax returns and financial statements will differ. Accepted financial accounting principles afford one (nonuniversal) measure of before-tax income; the Internal Revenue Code another measure. Although there are many differences between tax and financial accounting rules, the

<sup>14/</sup> Note should also be taken of differences between the reporting of foreign source income. In financial reports, all income of consolidated subsidiaries is reported on the same accrual basis. In tax returns, only the foreign source income of subsidiaries chartered in the United States is presented on an accrual basis; the income of subsidiaries chartered in foreign countries is reported only to the extent "repatriated" or paid as dividends to the U.S. parent corporation.

most significant have to do with accounting for capital consumption -- depreciation and depletion. In Section II, above, we noted that tax rules for these allowances incorporate features intended to provide a subsidy for specific kinds of investment and economic activity, and, where possible, we adjusted "taxable income" accordingly. Nevertheless, there is in many instances a remaining difference between the "adjusted income" reported here and the before-tax financial income which would be reported by the same corporations due to their use of financial accounting depreciation formulas that recover depreciable capital costs more slowly. On this account, more often than not, before-tax financial, or "book," income will exceed the "adjusted" income measure used in this report and this will raise a reconciliation issue, to which we now turn.

(3) Accounting for "taxes."

"Deferred taxes."

When financial accounting for depreciation differs from that used for tax purposes, the accepted accounting procedure for reconciling the difference between the two measure of before-tax income, often referred to as "normalization,"

gives rise to a quantity called "deferred income taxes." This item, of course, never appears in a tax return, for tax accounting merely requires the derivation of taxable income. When the method for determining the allowance for depreciation for financial accounting purposes differs from that allowed in tax accounting so that the current year financial allowance is less than that used in computing taxable income, say because financial accounting employs less "accelerated" methods and/or longer lives, then the before-tax financial income measure will exceed taxable income. Inasmuch as this difference between financial and tax accounting procedures essentially involves the time distribution of depreciation allowances which ultimately must aggregate to the same quantity, namely the cost of the depreciable assets, the difference between financial and taxable income, and hence the tax liability, must logically

be treated as a "deferral" of taxable income and a corresponding tax liability generated by this year's before-tax income. 15/ Thus the accepted accounting procedure requires that the amount of tax "deferred" be included with the net tax due the current year as "tax expense" the total of which when subtracted from before-tax (financial) income yields "net" or after-tax (financial) income.

If one is to compute an effective tax rate from financial statements, then, the observer must decide whether he believes the financial statement measure of depreciation is more nearly correct, in a given year, than the tax return measure of depreciation.

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15/ Since the preparer of a financial statement must certify the "correctness" of reported before-tax income, he is obligated to use his measure of depreciation for the year as "correct." The departure from this by the Internal Revenue Code is, from this point of view, an aberration.

- If he concludes the tax measure of depreciation is more nearly correct, then he should reduce before-tax (financial) income by the apparent understatement of depreciation and ignore "deferred tax." He should compute the effective tax rate from the financial statement by dividing income taxes due that year by the adjusted measure of before-tax income.
  
- If he concludes the financial statement of depreciation is more nearly correct, he must then estimate the probability that the "deferred tax" will ever be paid, and he must adjust the numerator, and/or denominator accordingly. There are two procedures that might be used for the adjustment: one follows a cash accounting approach, the other accrual methods.

Cash accounting:

Permanent deferral: If the observer believes that the corporation will continue to replace its depreciable capital indefinitely, then he will conclude the probability of repayment of "deferred tax" is zero. In this event, under

"cash accounting" rules, "deferred tax" may be ignored since it will never be repaid; and an effective tax rate would be computed by dividing the remaining tax due by the before-tax income reported in the financial statement.

Temporary deferral: If the observer believes that the corporation will experience a contraction in the near future, the "deferral" of tax reported in the current year is only temporary, for when failure to replace occurs, the relationship between financial and tax accounting depreciation allowances reverses and "deferred tax" will be repaid. It is the present value of this future payment of tax which, when added to tax due for the year, enters the numerator of an effective tax rate calculation, with financial before-tax income in the denominator. This involves some accrual procedures to account for the likelihood of future events.

Accrual accounting: Under this approach, the adjustments entail consistent accrual of tax expense for the year regardless of the form in which the tax is "paid" and corresponding adjustments to financial before-tax income.

Permanent deferral: If the probability that the tax will ever be repaid is zero, in effect the Treasury is making a nontaxable grant of the "deferred tax" to the corporation. Then this amount should be added to the reported financial before-tax income to signify the accrual of this income to the corporation during the report year. Since the tax generated by the corporation during the year is the sum of "deferred tax" plus tax otherwise due, this sum should be the quantity divided by the adjusted financial before-tax income to compute an effective tax rate. Altogether, permanent deferral entails two transactions: generating a tax liability during the year, part of which is "paid" in the form of a noninterest-bearing IOU; the other is recognizing that the future payment of the IOU is unlikely to occur, an implicit increase in the year's income resulting from the corporation's investment in property accorded preferred tax treatment.

Temporary Deferral: In this event the observer must again compute the present value of the tax to be paid in the future. The difference between this amount and the "deferred tax" for the year is a gain to the corporation. Then the amount of this gain, which is less than the total "deferred tax" should be added to the reported financial before-tax

income for use as a denominator in computing an effective tax rate. The numerator in this case, as in the case of permanent deferral above, includes both tax otherwise due and (total) "deferred tax."

(b) Other years' transactions in the current year tax account.

We have already noted that the tax account is used to clear refunds and subsidies in the form of credits in tax returns. The same usage occurs in financial accounting. However, the problems posed by this usage in financial statements are more severe because the current year's tax account will include refunds due to the carryforward of



unrequited losses and credits attributable to prior years.<sup>16/</sup> The effects of these non-current-year transactions need to be removed from the financial statement measure of tax in order to obtain the amount of tax attributable to this year's pre-tax income.

<sup>16/</sup> Problems posed by the financial accounting treatment of the investment credit should also be noted. There is no prescribed accounting standard for presenting the impact of the investment credit earned during a report year. Under one approach, the investment credit is simply treated as a "reduction of tax" in the year earned. Since the arithmetic of this procedure merely reduces the provision for income tax that is subtracted from income before-tax to derive "net income", this is called "flow-through." An alternative procedure treats the investment credit as a subsidy received from the government, the value of which is distributed over the life of the qualified investment. Provision for income tax is reduced only by the amount of the subsidy expiring during the year, not by the credit earned that year. Since this method distributes the "reduction in tax" over the life of the assets rather than all in the year the credit is earned, the procedure is called "normalization." Obviously, one needs to know how a corporation treats the credit if he is to use the "taxes" reported as the numerator of an effective tax rate calculation.

The information needed to effect all these adjustments to financial reports of income and taxes is rarely available. The recent Federal Trade Commission computation of effective tax rates paid by manufacturing corporations, submitted in testimony before the Subcommittee on Antitrust, Consumers and Employment of the House Committee on Small Business (March 21, 1978) illustrates these difficulties. That report, based on financial data submitted to the FTC quarterly by a sample of manufacturing corporations could not deal with "deferred taxes" by either of the two options mentioned above. For this reason, its reported effective tax rates are overstated. Nor could it rectify the annual "provision for Federal income taxes" to eliminate the embedded clearance of other years' transactions. The effect of this confusion of elements in the effective tax rate numerators is not predictable.

Due to all these difficulties in the use of financial statements, plus the broader coverage of corporations by size and industrial classification available in tax returns, and notwithstanding the remaining omissions from adjusted taxable income that have been noted previously, tax returns appear to afford the single best source of data on the taxability of corporation income.

**B. Interpretative precautions.**

The divergence between effective tax rates and statutory rates and the wide disparities in tax rates experienced by corporations in different industries exhibited in this report cannot be viewed as surprising. Since 1918, when Congress enacted the progenitor of percentage depletion in order to stimulate the discovery of additional petroleum reserves because gasoline supplies were then in dangerously short supply, the income tax has been utilized as a vehicle to modify resource flows in the private sector of the economy. Some of these uses of the tax laws, like percentage depletion, have been intentional: artificial bad debt deductions have been provided to facilitate the expansion of banking services; capital gains treatment was afforded timber production as a conservation measure; the investment credit was aimed to subsidize growth of the private capital stock to increase productivity per man-hour; the WIN credit was intended to encourage the employment of welfare mothers; the Western Hemisphere Trade Deduction was intended to foster greater participation of U.S. companies in the development of this part of the world; exemption of interest paid by state and local governments is intended to enable these governmental units to borrow more cheaply; and rapid

write-offs of depreciable assets have been provided to subsidize a wide range of particular kinds of investment perceived to be in the public interest, ranging from childcare facilities to pollution control equipment. Others, like intangible drilling cost deductions and similar treatment of other preproduction expenses, have crept into the tax laws inadvertently but were subsequently either sanctioned by explicit enactment or by refusal to amend the tax laws to eliminate the inadvertent preference.

(1) Implications of below statutory corporate effective tax rates.

In view of this history, it is important that the existence of low effective tax rates not be misinterpreted to mean only that some owners of corporations are not paying their fair share of tax and thereby enjoy higher after-corporate-tax rates of return. Indeed, as indicators of after-corporate-tax returns, effective tax rates are grossly misleading. If one compares the industry categories shown in Tables 2 and 3 as paying above average effective rates with those paying below average rates, he would be hardpressed in terms of general knowledge of the size, rate of growth and stockmarket status of their shares, to

determine which group of stockholders was enjoying the highest after-corporate-tax rate of return. Does one suppose the stockholders of automobile, chemical, computer and electrical machinery manufacturing companies eke-out a lower after-corporation-tax rate of return than do stockholders of banks and coal companies because the latter experience less than half the effective tax rates of the former? The answer clearly is negative. Because capital owners are concerned with after-corporation-tax rates of return, not with before-tax incomes, it is after-tax rates of return that are equalized through the mobility of capital. Flows of capital between industries ensures that the only difference between high- and low-tax rate industries will be higher pre-tax rates of return in the former, lower rates in the latter. The subsidized industries will have lower pre-tax profits because their expansion in response to the subsidies they have received either depresses market prices of their output or causes them to bid-up the costs of labor and materials they use.

The variances in industry effective tax rates are thus not indicators of shareholder benefits. Rather they are crude indicators of the ways in which the tax laws have been used to influence the pattern of economic activity in the

private sector. Resources have been pushed into the low effective tax rate industries and away from high tax rate industries.

(2) Effects on fairness of the tax system.

In effect, tax subsidies substitute for payments to producers they would normally receive in the form of market prices. Inasmuch as tax subsidies are in the form of tax-exempt income, they also permit taxpayers with above average incomes to escape paying their fair share of tax. For example, because the interest on state and local bond issues is tax-exempt, the bonds sell to yield returns that are below the yields of taxable issues; this is the subsidy element of the tax preference accorded state and local bond issues. Historically, the spread between taxable and nontaxable bonds has hovered around 30 percent -- if 10 percent is the yield on taxable securities, the comparable tax-exempt yield would be about 7 percent. Thus a purchaser of tax-exempt bonds pays, in this example, an "effective tax"

of 30 percent, and he "pays" this tax when purchasing tax-exempt bonds no matter what his income status otherwise would be. In this sense holders of tax-exempt bonds who would be subject to tax at more than 30 percent are not paying their fair share of tax. 17/

17/ In the effective rate calculations in this report, tax-exempt interest was simply added to the denominator. This procedure has the unfortunate effect of exaggerating the nontaxability of this form of income. An analytically correct way to deal with tax-exempt interest would be to include in the denominator the taxable equivalent of tax-exempt interest and include in the numerator the "implicit tax" associated with the spread between the taxable and nontaxable yields. For example, assume \$10 would be the taxable yield for a security held by a bank and the tax-exempt interest it actually earns is \$7. If we merely express actual taxes paid, \$0, as a percentage of the actual income earned, \$7, we obtain an effective tax rate of zero. But, if we add the \$3 spread to \$7 to derive \$10 of income in the denominator and then place the \$3 as an implicit tax in the numerator, we obtain the correct effective tax rate, 30 percent. This analytically superior treatment of tax-exempt interest could not be used for lack of necessary data in tax returns.

Similarly, the investment credit is a form of tax-exempt subsidy which happens to be cleared through the tax system. As such, \$1 of credit is clearly worth less to a small corporation subject to tax at 22 percent than to a larger corporation subject to tax at 48 percent. For the 22 percent taxpayer, \$1 of credit substitutes for a market (pre-tax) income receipt of only \$1.28; for the 48 percent taxpayer, the credit substitutes for \$1.92 in market income. 18/ Again, in this sense, recipients of the investment and WIN tax credits fail to pay their fair share of tax.

18/ In the effective tax calculations, the investment and WIN credits are treated as "reductions in tax." Another way to view these credits, which are almost indistinguishable from tax-exempt cash grants, is simply to treat them as such. In this event the before-credits tax would appear in the numerator of the effective tax rate calculation, and the credits earned would be added to the denominator. The result of this alternative calculation would be a higher effective tax rate than that computed by the procedure used in this report.



In sum, the pernicious aspect of tax subsidies is not so much that they substitute for explicit subsidies regarded by the Congress as serving the public interest and thereby cause effective tax rates to appear low, but that subsidies provided through remissions of tax almost invariably provide subsidy benefits in nontaxable form.<sup>19/</sup> This has two highly undesirable effects. First, in an economy such as the United States, market prices serve to value resources. Gross National Product, for example, is measured in market prices. But market prices are generally in pre-tax terms. Thus, when the government wishes to carry out a procurement or other expenditure program, the dollars it budgets must be in pre-tax terms; and this fairly measures the economic significance of the programs. However, if government carries out its programs either by the expenditure of nontaxable funds, as in the case of unemployment compensation and social

<sup>19/</sup> One recent exception to this generalization is the New Jobs Credit enacted in 1977. This credit is structured so that it enters the taxable incomes of employers (if wages do not rise) or employees, just as would an equivalent wage subsidy paid in cash by the Department of Labor.

security payments, or by remission of tax--a nontaxable "tax expenditure"--the budgetary impact understates the economic magnitude of the government program: if the same program that is financed by tax-exempt expenditures or nontaxable tax subsidies were financed by normal expenditure programs, the dollar cost would be properly seen to be higher. By appearing to be "cheap," tax subsidies may be overused.

Second, in a tax system that imposes progressive rates, implementation of government programs by nontaxable expenditures and tax subsidies confers benefits that are proportional to the income status of the taxpayer. Put another way, such programs enable taxpayers to legally avoid paying their fair, statutory, share of taxes to support the activities of government, including the activities subsidized.

Table 1.—Income Measures, United States and Foreign Tax Liabilities, For Nonfinancial Corporations Filing Income Tax Returns, By Size of Adjusted Assets, 1972

	Asset Size (dollars)												
	All sizes	1 under 50,000	50,000 under 250,000	250,000 under 1,000,000	1,000,000 under 5,000,000	5,000,000 under 10,000,000	10,000,000 under 25,000,000	25,000,000 under 50,000,000	50,000,000 under 1 bill.	1 bill. under 25 bill.	25 bill. under 5 bill.	5 bill. under 10 bill.	10 bill. or more
I.													
(dollar amounts in millions)													
All corporations, with and without basic worldwide taxable income:													
Number.....(a)	1,625,113	716,647	604,393	232,789	58,267	6,161	3,606	1,363	732	585	247	148	175
U.S. tax, after credits.....(b)	29,130	211	1,254	2,738	3,643	1,400	1,691	1,373	1,514	2,285	2,190	2,336	8,498
Basic worldwide taxable income.....(c)	75,150	-253	3,810	6,670	7,028	2,699	3,287	2,907	3,317	5,313	5,289	5,952	29,130
Effective tax rate.....(d)	38.8	-	32.9	41.0	51.8	51.9	51.4	47.2	45.7	43.0	41.4	39.2	29.2
II.													
Corporations with basic worldwide income taxable as such (excludes Subchapter S and DISC corporations):													
Number.....(a)	752,331	235,978	320,396	149,151	38,008	3,989	2,417	928	532	451	198	129	154
U.S. tax, after credits.....(b)	29,100	211	1,253	2,736	3,641	1,399	1,668	1,372	1,512	2,283	2,189	2,333	8,481
Basic worldwide taxable income.....(c)	84,280	1,003	4,741	7,537	8,585	3,221	3,904	3,227	3,660	5,870	5,803	6,779	29,950
Effective tax rate.....(d)	34.5	21.0	26.4	36.3	42.4	43.4	43.2	42.5	41.3	38.9	37.7	34.4	28.3
III.													
Corporations with adjusted worldwide income:													
Number.....(a)	871,865	300,486	357,612	162,049	41,940	4,451	2,707	1,038	593	494	203	134	159
Worldwide tax liabilities, net of U.S. investment and WIN credits....(b)	38,220	269	1,348	2,811	3,725	1,443	1,761	1,454	1,638	2,632	2,538	2,985	15,620
Adjusted worldwide income.....(c)	93,640	1,305	5,315	8,186	9,382	3,543	4,303	3,542	4,036	6,449	6,251	7,342	33,780
Effective tax rate.....(d)	40.9	20.6	25.4	34.3	39.7	40.7	40.9	41.0	40.6	40.8	40.6	40.7	46.2

Table 1.-Income Measures, United States and Foreign Tax Liabilities; For Nonfinancial Corporations Filing Income Tax Returns, By Size of Adjusted Assets; 1972

		Asset Size (dollars)												
		1	50,000	250,000	1,000,000	5,000,000	10,000,000	25,000,000	50,000,000	1 bill.	.25 bill.	.25 bill.	1 bill.	
All	under	under	under	under	under	under	under	under	under	under	under	under	under	or
size	50,000	250,000	1,000,000	5,000,000	10,000,000	25,000,000	50,000,000	100,000,000	25 bill.	.5 bill.	1 bill.	more		
		(dollar amounts in millions)												
<b>IV.</b>														
Corporations with U.S. source adjusted income:														
Number.....(a)	871,548	300,435	357,571	161,992	41,856	4,430	2,692	1,029	579	485	199	128	152	
U.S. tax liability after investment and WIN credit.(b)	29,610	268	1,347	2,808	3,696	1,419	1,719	1,391	1,533	2,313	2,218	2,374	8,521	
Adjusted U.S. source income..(c)	78,330	1,302	5,310	8,174	9,298	3,473	4,177	3,375	3,760	5,676	5,348	5,830	22,600	
Effective tax rate.....(d)	37.8	20.6	25.4	34.4	39.8	40.8	41.2	41.2	40.8	40.8	41.5	40.7	37.7	
<b>V.</b>														
Corporations with foreign source income:														
Number.....(a)	4,240	141	423	659	1,111	377	443	276	221	266	123	94	106	
Foreign tax liabilities.....(b)	8,530.7	0.4	0.5	2.6	23.9	23.7	39.9	61.4	102.2	308.9	319.4	594.0	7,053.8	
Foreign source income.....(c)	15,210.0	3.6	3.2	11.2	85.6	69.4	126.9	172.4	305.8	819.5	889.6	1,527.3	11,190.0	
Effective tax rate.....(d)	56.1	11.3	14.3	23.1	28.0	34.2	31.4	35.6	33.4	37.7	35.9	38.9	63.0	

Office of the Secretary of the Treasury  
Office of Tax Analysis

Table 2.- Effective Tax Rates on Worldwide Income,  
All Corporations With Income, and Corporations  
With Under \$1,000,000 of Assets, by Industry; 1972

Industry	All Corporations		Corporations with under \$1,000,000 of Assets	
	Industry rank	Effective tax rate	Effective tax rate	Corporations included
-----P e r c e n t-----				
Petroleum and natural gas	1	59.4	23.8	85.1
Manufacturing, not elsewhere classified	2	41.9	32.3	86.2
Wholesale and retail trade	3	38.8	32.0	94.9
Credit dealers, brokers, insurance agents	4	38.1	29.1	95.1
Paper and allied products	5	37.4	32.4	79.5
Communications	6	35.7	27.6	79.6
Electric, gas, and sanitary services	7	35.4	28.0	89.8
Lumber and wood products (nonfurniture)	8	34.2	32.2	87.5
Contract construction	9	33.7	28.4	95.2
Primary metals: ferrous	10	33.1	33.2	75.7
Primary metals: nonferrous	11	32.4	25.4	72.4
Services	12	31.6	26.5	97.5
Transportation	13	30.3	26.6	94.3
Real estate	14	28.9	26.2	94.7
Agriculture, forestry, and fisheries	15	28.0	23.6	94.4
Unclassifiable businesses	16	27.0	25.4	98.8
Coal Mining	17	26.7	24.7	84.3
Mining, not elsewhere classified	18	26.2	22.4	76.8
Banking	19	19.4	26.8	6.7

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Office of the Secretary of the Treasury  
Office of Tax Analysis

Table 2a.—Effective Tax Rates on Worldwide Income, All Corporations With Income, by Industry and Size of Assets; 1972

Industry	Asset size (dollars)												
	All size	1 : 50,000	1 : 250,000	1 : 1,000,000	1 : 5,000,000	1 : 10,000,000	1 : 25,000,000	1 : 50,000,000	1 : 100,000,000	1 : 250,000,000	1 : 500,000,000	1 : 1,000,000,000	1 : more
(Dollar amounts in thousands)													
<b>Petroleum &amp; natural gas</b>													
a.....	3,896	1,154	1,443	718	392	60	41	31	13	16	5	4	19
b.....	6,154,972	1,234	7,169	9,435	32,160	11,957	13,689	35,676	12,693	30,385	70,566	106,697	5,821,312
c.....	10,370,000	8,460	32,363	36,108	104,081	46,976	60,184	103,200	56,873	115,072	180,602	205,800	9,424,943
d.....	59.4	19.1	22.2	26.1	30.9	25.4	26.1	34.5	22.3	26.4	39.0	51.8	61.8
<b>Manufacturing not elsewhere classified</b>													
a.....	101,120	24,565	37,698	24,860	10,300	1,547	1,008	434	265	234	96	65	49
b.....	17,740,000	24,674	176,949	661,313	1,369,089	682,593	914,479	797,999	997,162	1,709,830	1,819,956	2,026,364	6,559,199
c.....	42,340,000	118,784	712,213	1,843,761	3,330,523	1,595,464	2,145,554	1,491,828	2,331,000	4,056,048	4,303,458	4,783,185	15,230,000
d.....	41.9	20.8	24.8	35.9	41.1	42.8	42.6	42.2	42.8	42.2	42.3	42.4	43.1
<b>Wholesale and retail trade</b>													
a.....	302,573	84,828	139,258	62,953	13,560	1,020	570	194	90	62	14	10	8
b.....	5,600,293	75,918	569,761	1,208,577	1,308,778	322,161	333,525	283,117	192,095	243,916	181,670	227,769	753,006
c.....	14,420,000	351,246	2,119,501	3,331,895	2,904,028	756,139	799,710	641,679	464,011	574,360	442,469	560,317	1,477,513
d.....	38.8	21.6	26.9	36.3	41.5	42.6	41.7	44.1	41.4	42.5	41.1	40.6	51.0
<b>Credit and insurance agents</b>													
a.....	49,186	22,228	18,414	6,124	1,836	224	201	77	41	23	9	4	4
b.....	248,433	20,381	74,579	85,942	113,380	50,480	74,247	41,479	87,376	54,318	38,034	87,926	120,362
c.....	2,225,536	96,013	275,261	251,113	282,879	119,061	176,133	100,215	212,911	135,045	92,116	197,713	281,077
d.....	38.1	21.2	27.1	34.2	39.2	42.4	42.2	41.3	41.0	40.2	41.3	44.5	42.8
<b>Paper and allied products</b>													
a.....	2,284	177	780	859	312	50	43	11	22	15	4	6	4
b.....	586,804	78	3,284	21,485	36,527	19,494	22,767	15,437	86,186	73,254	32,681	57,272	218,360
c.....	1,567,136	862	15,354	60,566	87,663	48,119	58,622	38,932	210,008	194,573	101,572	199,643	551,211
d.....	37.4	9.0	21.4	35.5	41.7	40.5	38.8	39.5	41.0	37.6	32.2	28.7	39.6
<b>Communications</b>													
a.....	3,841	633	1,686	739	619	66	44	15	15	10	5	-	6
b.....	1,258,969	407	7,215	10,248	40,406	14,450	28,429	7,793	15,163	38,787	32,211	-	963,451
c.....	3,528,297	2,318	29,270	33,065	108,091	37,280	68,940	20,079	44,598	46,046	87,472	-	2,763,893
d.....	35.7	17.6	24.6	31.0	37.4	38.8	41.2	38.8	34.0	34.6	36.8	-	34.9

a = Number; b = Worldwide tax liabilities net of U.S. investment and WIN credit; c = Adjusted worldwide income; d = Effective tax rate

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Table 2a.-Effective Tax Rates on Worldwide Income, All Corporations With Income, by Industry and Size of Assets; 1972

Industry, Item	Asset size (dollars)													
	All	1	50,000	250,000	1,000,000	5,000,000	10,000,000	25,000,000	50,000,000	1 billion	25 billion	5 billion	1 billion	
	size	size	size	size	size	size	size	size	size	size	size	size	size	
	(dollar amounts in thousands)													
<b>Electric, gas, and sanitary services</b>														
a.....	4,534	1,700	1,755	615	173	35	60	29	25	41	34	26	42	
b.....	1,363,293	646	7,150	12,989	9,556	6,146	19,124	23,933	26,716	107,901	164,417	204,901	779,613	
c.....	3,853,979	3,802	31,632	39,506	27,497	17,011	49,756	65,436	69,042	282,289	426,003	577,831	2,269,124	
d.....	35.4	17.0	23.2	32.9	34.8	36.1	38.4	39.5	38.7	38.2	38.6	35.5	34.4	
<b>Lumber and wood products (nonfurniture)</b>														
a.....	5,871	913	2,641	1,586	591	74	39	10	6	8	-	-	-	
b.....	437,308	865	10,809	47,571	95,913	41,148	30,270	13,829	20,068	39,535	-	-	-	
c.....	1,279,036	4,352	47,516	132,257	242,519	102,758	77,234	39,097	55,877	117,125	-	-	-	
d.....	34.2	19.9	22.8	36.0	39.6	40.0	39.2	35.4	35.9	33.8	-	-	-	
<b>Contract construction</b>														
a.....	73,223	28,613	29,438	11,684	3,036	250	132	54	22	11	-	-	-	
b.....	901,312	30,711	133,760	219,186	258,879	64,414	63,567	22,851	40,199	62,951	-	-	-	
c.....	2,676,493	150,467	542,022	656,713	678,637	167,594	157,361	60,580	102,979	142,199	-	-	-	
d.....	33.7	20.4	24.7	33.4	38.2	38.4	40.4	37.7	39.0	44.3	-	-	-	
<b>Primary metals- ferrous</b>														
a.....	1,730	405	496	408	282	53	33	19	11	10	5	-	7	
b.....	447,086	519	2,514	11,139	46,441	22,205	28,828	25,621	21,680	72,722	25,337	-	189,926	
c.....	1,351,711	2,348	10,208	30,184	110,452	53,547	65,761	63,698	59,472	176,901	83,837	-	682,800	
d.....	33.1	22.1	24.6	36.9	42.0	41.5	43.8	40.2	36.4	41.1	30.2	-	27.8	
<b>Unclassifiable businesses</b>														
a.....	2,865	2,154	487	189	29	-	-	-	-	-	-	-	-	
b.....	8,698	2,390	2,188	1,933	1,531	-	-	-	-	-	-	-	-	
c.....	32,185	9,269	7,765	8,637	3,513	-	-	-	-	-	-	-	-	
d.....	27.0	25.8	28.2	22.4	43.6	-	-	-	-	-	-	-	-	
<b>Coal mining</b>														
a.....	737	177	243	196	70	19	10	10	3	-	-	-	-	
b.....	52,752	126	1,438	3,026	6,798	5,458	4,410	4,175	4,414	-	-	-	-	
c.....	197,596	577	5,655	12,315	24,831	19,836	17,651	21,656	16,723	-	-	-	-	
d.....	26.7	21.8	25.4	24.6	27.4	27.5	25.0	19.3	26.4	-	-	-	-	

a = Number; b = Worldwide tax liabilities net of U.S. investment and WIN credits; c = Adjusted worldwide income; d = Effective tax rate

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Table 2a.-Effective Tax Rates on Worldwide Income, All Corporations With Income, by Industry and Size of Assets; 1972

Industry item	Asset size (dollars)												
	All sizes	1 under 50,000	50,000 under 250,000	250,000 under 1,000,000	1,000,000 under 5,000,000	5,000,000 under 10,000,000	10,000,000 under 25,000,000	25,000,000 under 50,000,000	50,000,000 under 100,000,000	100,000,000 under .25 bill.	.25 bill. under .5 bill.	.5 bill. under 1 bill.	1 bill. or more
(dollar amounts in thousands)													
Mining not elsewhere classified													
a.....	1,863	-	752	679	248	47	21	11	-	-	-	-	-
b.....	67,420	-	2,702	9,899	15,268	11,234	7,435	8,586	-	-	-	-	-
c.....	257,395	-	14,121	42,058	57,260	41,272	26,299	33,279	-	-	-	-	-
d.....	26.2	-	19.1	23.5	26.7	27.2	28.3	25.3	-	-	-	-	-
Banking													
a.....	17,947	-	385	823	5,787	3,774	3,528	1,573	897	601	227	117	78
b.....	1,646,672	-	1,562	3,282	76,063	100,677	157,800	133,218	134,872	220,569	182,813	152,624	483,090
c.....	8,495,566	-	4,895	13,180	365,883	530,487	869,165	697,609	675,026	1,042,793	901,414	882,036	2,512,773
d.....	19.4	-	31.9	24.9	20.8	19.0	18.2	19.1	20.0	21.2	20.3	17.3	19.2

a = Number; b = Worldwide tax liabilities net of U.S. investment and WUN credit; c = Adjusted worldwide income; d = Effective tax rate



Table 3.—Effective Tax Rates on U.S. Source Income  
 All Corporations With Income and Corporations  
 With Under \$1,000,000 of Assets, by Industry, 1972

Industry <sup>1/</sup>	All corporations		Corporations with under \$1,000,000 of Assets	
	Industry rank	Effective tax rate	Effective tax rate	Corporations included
			-----P e r c e n t-----	
Manufacturing not elsewhere classified	1	42.0	32.3	86.2
Paper and allied products	2	38.4	32.4	79.5
Credit dealers, brokers, insurance agents	3	38.3	29.0	95.1
Wholesale and retail trade	4	38.0	32.0	94.9
Communications	5	36.1	27.6	79.6
Electric, gas, and sanitary services	6	35.3	28.0	89.8
Lumber and wood products (nonfurniture)	7	34.6	32.2	87.5
Primary metals: ferrous	8	33.7	33.2	75.8
Contract construction	9	33.4	28.4	95.2
Services	10	31.6	26.5	97.6
Transportation	11	30.1	26.6	94.3
Primary metals: nonferrous	12	29.4	25.4	72.6
Real estate	13	28.9	26.2	94.7
Agriculture, forestry and fisheries	14	28.1	23.4	94.4
Unclassifiable businesses	15	27.7	26.1	98.8
Mining not elsewhere classified	16	25.6	22.4	76.9
Petroleum and natural gas	17	24.7	23.8	85.5
Coal mining	18	19.4	24.7	84.3
Banking	19	18.6	26.8	6.7

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<sup>1/</sup> See Appendix for detailed industry categories in groupings shown here.

Table 3a-Effective Tax Rates on U.S. Source Income, All Corporations with Income, by Industry and Size of Assets; 1972

Industry, item	Asset Size (dollars)												
	All	1	50,000	250,000	1,000,000	5,000,000	10,000,000	25,000,000	50,000,000	1 bill.	25 bill.	5 bill.	1 bill.
Item sizes	50,000	250,000	1,000,000	5,000,000	10,000,000	25,000,000	50,000,000	100,000,000	25 bill.	5 bill.	1 bill.	or	more
(Dollar amounts in thousands)													
<b>Manufacturing, not elsewhere classified</b>													
a.....	101,026	24,565	37,683	24,852	10,276	1,534	1,002	429	255	228	93	62	47
b.....	15,290,000	24,674	176,244	660,443	1,359,798	669,408	889,302	764,692	921,756	1,490,247	1,546,463	1,606,829	5,182,941
c.....	36,430,000	118,784	709,889	1,840,506	3,303,413	1,557,431	2,071,128	1,789,779	2,134,216	3,497,982	3,496,338	3,688,296	12,220,000
d.....	42.0	20.8	24.8	35.9	41.2	43.0	42.9	42.7	43.2	42.6	44.2	43.6	42.4
<b>Paper and allied products</b>													
a.....	2,284	177	780	859	312	50	43	11	22	15	4	6	4
b.....	521,649	78	3,284	21,465	36,523	18,810	22,530	15,378	75,360	72,670	30,312	48,420	176,639
c.....	1,357,882	862	15,354	60,475	87,460	46,370	58,014	38,387	181,414	192,972	95,916	170,936	409,722
d.....	38.4	9.0	21.4	35.5	41.8	40.6	38.8	40.1	41.5	37.7	31.6	28.4	43.1
<b>Credit dealers, brokers, insurance agents</b>													
a.....	49,164	22,228	18,399	6,122	1,836	224	199	76	40	23	9	4	-
b.....	822,426	20,381	74,540	85,596	112,952	50,057	71,710	40,989	83,169	52,145	36,736	87,630	-
c.....	2,147,277	96,010	275,231	250,443	287,627	117,377	168,472	98,760	201,965	127,998	86,854	192,559	-
d.....	38.3	21.2	27.1	34.2	39.3	42.6	42.6	41.5	41.2	40.7	42.3	45.5	-
<b>Wholesale and retail trade</b>													
a.....	302,511	84,828	139,258	62,923	13,545	1,013	567	195	88	61	18	9	7
b.....	5,290,425	75,841	569,760	1,207,296	1,202,369	317,498	328,907	269,661	189,843	220,127	167,395	183,030	558,698
c.....	13,920,000	350,117	2,117,564	3,327,509	2,882,017	740,177	785,031	617,861	457,985	525,114	406,158	448,136	1,267,055
d.....	38.0	21.7	26.9	36.3	41.7	42.9	41.9	43.6	41.4	41.9	41.2	40.8	44.1
<b>Communications</b>													
a.....	3,841	633	1,686	739	619	66	44	15	15	10	5	-	6
b.....	1,232,402	407	7,215	10,248	40,406	14,450	28,429	7,793	13,762	38,464	31,948	-	948,321
c.....	3,413,691	2,318	29,270	33,065	108,091	37,280	68,940	20,079	40,729	92,032	86,831	-	2,694,345
d.....	36.1	17.6	24.6	31.0	37.4	38.8	41.2	38.8	33.8	41.8	36.8	-	35.2

a = Number; b = Worldwide tax liabilities net of U.S. investment and WIN credit; c = Adjusted worldwide income; d = Effective tax rate.

Table 3a.-Effective Tax Rates on U.S. Source Income, All Corporations With Income, by Industry and Size of Assets, 1972

Industry	Asset Size (dollars)												
	All	under 50,000	50,000 to 250,000	250,000 to 1,000,000	1,000,000 to 5,000,000	5,000,000 to 10,000,000	10,000,000 to 25,000,000	25,000,000 to 50,000,000	50,000,000 to 1 bill.	1 bill. to 25 bill.	25 bill. to 50 bill.	50 bill. to 1 bill.	1 bill. or more
Item	size	50,000	250,000	1,000,000	5,000,000	10,000,000	25,000,000	50,000,000	100,000,000	250,000,000	500,000,000	1,000,000,000	or more
(dollar amounts in thousands)													
<b>Electric, gas, and sanitary services</b>													
a.....	4,534	1,700	1,755	615	173	35	60	29	25	41	34	26	42
b.....	1,354,513	646	7,350	12,989	9,556	6,146	19,124	23,727	26,716	107,058	164,417	204,187	772,597
c.....	3,835,767	3,802	31,632	39,506	27,497	17,011	49,756	60,054	69,042	280,523	426,003	574,492	2,256,438
d.....	35.3	17.0	23.2	32.9	34.8	36.1	38.4	37.5	38.7	38.2	38.6	35.5	34.2
<b>Lumber and wood products (nonfurniture)</b>													
a.....	5,871	913	2,641	1,586	591	74	39	10	6	8	-	-	-
b.....	431,952	865	10,809	47,371	95,856	41,036	30,256	13,821	20,033	39,480	-	-	-
c.....	1,248,761	4,352	47,516	132,757	242,087	102,434	76,850	39,044	55,710	116,733	-	-	-
d.....	34.6	19.9	22.8	36.0	39.6	40.1	39.4	35.4	36.0	33.8	-	-	-
<b>Primary metals: ferrous</b>													
a.....	1,727	405	496	408	281	53	32	19	11	10	5	-	7
b.....	390,370	519	2,514	11,130	45,459	22,204	28,503	25,799	20,281	61,842	22,768	-	149,985
c.....	1,157,523	2,348	10,208	30,108	108,399	53,546	64,866	60,904	55,498	152,213	76,480	-	530,446
d.....	33.7	22.1	24.6	37.0	41.9	41.5	43.9	41.1	36.5	40.6	29.8	-	28.3
<b>Contract construction</b>													
a.....	73,215	28,613	29,438	11,684	3,032	250	131	33	21	10	-	-	-
b.....	871,266	30,711	133,760	219,186	255,134	64,303	62,490	21,177	38,136	41,731	-	-	-
c.....	2,604,656	150,467	542,022	656,396	668,216	167,152	152,765	54,033	97,644	98,851	-	-	-
d.....	33.4	20.4	24.7	33.4	38.2	38.5	40.9	38.8	39.1	42.2	-	-	-
<b>Services</b>													
a.....	151,288	90,470	43,321	13,803	3,034	331	194	59	30	27	5	4	-
b.....	1,059,348	78,803	164,799	214,528	177,509	81,642	81,849	77,600	43,842	61,430	15,470	61,876	-
c.....	3,352,128	395,608	666,824	664,049	493,694	215,332	209,466	193,174	132,563	179,077	54,903	167,487	-
d.....	31.6	19.9	24.7	32.3	36.0	37.9	39.1	40.2	33.1	34.3	28.2	42.0	-
<b>Transportation</b>													
a.....	26,321	9,864	10,518	4,630	1,077	174	122	50	29	21	17	7	13
b.....	781,512	7,360	38,693	78,065	91,698	49,223	76,922	54,164	49,504	49,979	134,060	63,360	88,485
c.....	2,593,240	39,677	180,174	247,572	245,013	128,497	192,055	150,823	148,349	149,903	371,861	188,415	550,901
d.....	30.1	18.6	21.5	31.5	37.4	38.3	40.0	35.9	34.9	33.3	36.0	33.6	16.1

a - Number; b - Worldwide tax liabilities net of U.S. investment and WIN credit; c - Adjusted worldwide income; d - Effective tax rate.

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Table 3a.-Effective Tax Rates on U.S. Source Income, All Corporations With Income, by Industry and Size of Assets; 1972

Industry Item	Asset Size (dollars)												
	All sizes	1 : under 50,000	50,000 : under 250,000	250,000 : under 1,000,000	1,000,000 : under 5,000,000	5,000,000 : under 10,000,000	10,000,000 : under 25,000,000	25,000,000 : under 50,000,000	50,000,000 : under 100,000,000	100,000,000 : under 250,000,000	250,000,000 : under 500,000,000	500,000,000 : under 1,000,000,000	1,000,000,000 : or more
(dollar amounts in thousands)													
Primary metals:													
nonferrous													
a.....	1,243	177	442	283	238	43	22	7	15	6	-	-	5
b.....	221,149	387	2,496	4,574	33,402	14,248	13,592	7,922	37,486	21,994	-	-	17,932
c.....	752,563	4,003	9,057	16,284	80,911	35,163	34,835	19,510	113,431	69,869	-	-	160,048
d.....	29.4	9.7	27.6	28.1	41.3	40.5	39.0	40.4	33.0	31.5	-	-	11.2
Real estate													
a.....	133,189	31,081	65,292	29,714	6,218	499	257	82	26	17	-	-	-
b.....	695,230	19,663	136,041	195,139	169,307	40,094	48,480	34,963	19,107	27,416	-	-	-
c.....	2,402,425	95,309	553,351	689,793	518,543	137,291	156,492	103,653	51,681	81,442	-	-	-
d.....	28.9	20.6	24.6	28.3	32.6	29.2	31.0	33.7	37.0	33.7	-	-	-
Agriculture, forestry, and fisheries													
a.....	18,421	5,324	7,311	4,756	906	74	37	8	-	4	-	-	-
b.....	177,472	7,145	21,478	48,623	47,798	15,693	13,196	7,993	-	10,184	-	-	-
c.....	631,835	36,016	110,356	181,193	151,184	42,945	45,603	22,523	-	28,712	-	-	-
d.....	28.1	19.8	19.5	26.8	31.6	36.5	28.9	35.0	-	35.5	-	-	-
Unclassifiable businesses													
a.....	2,864	2,154	487	189	29	-	-	-	-	-	-	-	-
b.....	8,420	2,112	2,188	1,933	1,531	-	-	-	-	-	-	-	-
c.....	30,368	7,452	7,765	8,637	3,513	-	-	-	-	-	-	-	-
d.....	27.7	28.3	28.2	22.4	43.6	-	-	-	-	-	-	-	-
Mining not elsewhere classified													
a.....	1,862	-	752	679	248	47	21	11	-	-	-	-	-
b.....	61,855	-	2,622	9,899	15,268	11,233	6,628	8,586	-	-	-	-	-
c.....	241,699	-	13,778	42,058	57,260	41,269	25,104	33,276	-	-	-	-	-
d.....	25.6	-	19.0	23.5	26.7	27.2	26.4	25.8	-	-	-	-	-

a = Number; b = Worldwide tax liabilities net of U.S. investment and WIN credit; c = Adjusted worldwide income; d = Effective tax rate.

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Table 3a.-Effective Tax Rates on U.S. Source Income, All Corporations With Income, by Industry and Size of Assets; 1972

Industry item	Asset Size (dollars)												
	All sizes	1 under 50,000	50,000 under 250,000	250,000 under 1,000,000	1,000,000 under 5,000,000	5,000,000 under 10,000,000	10,000,000 under 25,000,000	25,000,000 under 50,000,000	50,000,000 under 100,000,000	.1 bill. under .25 bill.	.25 bill. under .5 bill.	.5 bill. under 1 bill.	1 bill. or more
(dollar amounts in thousands)													
<b>Petroleum and natural gas</b>													
a.....	3,878	1,154	1,443	718	379	60	40	30	13	15	4	4	18
b.....	714,643	1,234	7,169	9,406	31,026	11,956	12,069	29,609	11,826	25,727	55,172	20,957	498,491
c.....	2,893,401	6,460	32,363	36,050	101,678	46,973	50,104	89,239	53,004	100,517	157,061	118,183	2,101,769
d.....	24.7	19.1	22.2	26.1	30.5	25.4	24.1	35.2	22.3	25.6	35.1	17.7	23.7
<b>Coal mining</b>													
a.....	737	177	248	196	70	19	10	10	-	-	-	-	-
b.....	35,739	126	1,438	3,026	6,798	5,457	4,410	4,176	-	-	-	-	-
c.....	184,017	577	5,655	12,315	24,831	19,834	17,651	21,656	-	-	-	-	-
d.....	19.4	21.8	25.4	24.6	27.4	27.5	25.0	19.3	-	-	-	-	-
<b>Banking</b>													
a.....	17,938	-	384	823	5,787	3,774	3,527	1,578	897	599	227	117	72
b.....	1,413,574	-	1,562	3,282	76,063	100,676	157,735	133,208	134,803	217,336	181,236	147,283	260,287
c.....	7,616,205	-	4,895	13,180	365,883	530,457	868,841	697,541	674,652	1,029,589	892,091	853,489	1,685,280
d.....	18.6	-	31.9	24.9	20.8	19.0	18.2	19.1	20.0	21.1	20.3	17.3	15.4

a = Number; b = Worldwide tax liabilities net of U.S. investment and WIN credit; c = Adjusted worldwide income; d = Effective tax rate.

## Appendix

Industry Descriptions

- 1 Agriculture, forestry, fisheries
- 2 Banking
  - Mutual savings banks
  - Banks and trust companies
  - Savings and loan associations
- 3 Coal mining
- 4 Communications
- 5 Contract construction
- 6 Credit dealers, brokers, insurance agents
  - Personal, business, and other credit agencies
  - Securities brokers, dealers and flotation companies
  - Commodity brokers and dealers, security and commodity exchange and allied services
  - Insurance agents, brokers, and service
  - Other real estate and combinations of real estate, insurance, loan, and law offices
- 7 Electric, gas and sanitary services
- 8 Lumber and wood products (nonfurniture)
- 9 Manufacturing not elsewhere classified
  - Apparel and textiles
  - Chemicals and allied products
  - Fabricated metal products
  - Food and kindred
  - Furniture and fixtures
  - Leather and leather products
  - Machinery
  - Miscellaneous manufacturing products
  - Printing and publishing
  - Scientific instruments, photographic equipment, watches, clocks
  - Stone, clay and glass products
  - Tobacco
  - Transportation equipment
- 10 Other mining
  - Miscellaneous metal mining
  - Non metallic minerals (except fuels) mining
- 11 Paper and allied products

- 12 Petroleum and natural gas
  - Crude petroleum and natural gas
  - Petroleum refining and related industries
- 13 Primary metals: ferrous
  - Iron ore mining
  - Ferrous metal processing and basic products, and primary metal products not elsewhere classified
- 14 Primary metals: nonferrous
  - Copper, lead and zinc, gold and silver ores
  - Nonferrous metal processing and basic products
- 15 Real estate
  - Except other real estate combinations of real estate, insurance, loan and law offices
- 16 Services
- 17 Transportation
- 18 Unclassifiable business
- 19 Wholesale and retail trade

Definitions of Terms

Adjusted assets - Total assets less the smaller of "accounts payable" or "accounts receivable". Accounts receivable are trade notes and accounts receivable minus allowance for bad debts plus other current assets. Accounts payable are accounts payable plus mortgages due in less than one year plus other current liabilities.

Adjusted U.S. source income - See U.S. source adjusted income.

Adjusted worldwide income - Basic worldwide taxable income plus charitable contributions, tax exempt interest, public utilities dividend paid deduction, Western Hemisphere Trade deduction, other preferences as defined in the minimum tax calculation, foreign taxes deemed paid and not elsewhere included in income, and the net operating loss deduction.

Basic Worldwide Taxable Income - Net income as defined by the Internal Revenue Code, i.e., gross income from all sources less all allowable deductions, including the so-called special deductions for net operating loss carryforward, dividends received, and Western Hemisphere Trade.

Deferred income taxes - When financial report income exceeds taxable income because certain deductions are taken for tax purposes prior to the time they will be recorded in the financial books-of-account, this is taken to mean that income tax on the difference between the two measures of income is "deferred." Deferred taxes are therefore estimates of the current year's tax expense which will be paid in some future year.

DISC corporations - Domestic International Sales Corporations established by The Revenue Act of 1971, Public Law 92-178, are entitled to special tax treatment for taxable years beginning on or after January 1, 1972. The income of these corporations is untaxed and one half of such income is deemed to be distributed to the parent corporation and taxed at the parent corporation level.



Foreign source income - Reported Form 1118 source income plus the Western Hemisphere Trade Deductions plus foreign taxes deemed paid and not elsewhere included in income.

Foreign tax credit carryforward - A credit for taxes paid on foreign source income in excess of U.S. statutory rates in a previous year used to reduce current year U.S. tax payments.

Foreign tax liabilities - Foreign taxes paid and deemed paid

Investment tax credit - A tax credit equal to 7 percent in 1972 of the purchase price of machinery and equipment with a useful life of 7 years or more. The credit for shorter-lived property is reduced. The amount of the credit in any one year cannot exceed the first \$25,000 of tax liability for the year plus one-half the tax liability in excess of \$25,000.

Net operating loss carryforward - A taxable income deficit in previous years deducted from current year income.

Subchapter S corporations - Certain small corporations with fewer than 10 stockholders and having one class of stock that are subject only to capital gains taxes on certain transactions. The taxable income of such corporations is attributed and taxed to shareholders whether or not distributed.

Worldwide tax liabilities, net of U.S. investment and WIN credits - Net domestic income and minimum taxes due plus foreign taxes paid and deemed paid plus foreign tax credits carried forward and taken plus tax on recomputation of the investment credit.

U.S. tax liability after investment and WIN credit - Worldwide tax liabilities net of U.S. investment and WIN credits minus foreign tax liabilities.

U.S. source adjusted income - Adjusted worldwide income minus foreign source income.

U.S. tax after credits - Total taxes paid. This is the net income and minimum tax due and payable to the Treasury after foreign, investment and work incentive credits.

WIN credit - A tax credit of 20 percent of certain expenses incurred in the employment of welfare recipients.

[The prepared statement of Mr. Smith follows:]

STATEMENT OF RICHARD M. SMITH, DIRECTOR, POLICY COORDINATION POLICY AND EVALUATION, DEPARTMENT OF ENERGY

I am pleased to appear before you today to discuss briefly financial issues regarding the oil and gas industry and the significance of these issues to future exploration and development.

Assembling a complete picture of the capital requirements, profitability, and motivating financial elements of the oil and gas production industry is a complex task. Mr. Sunley, of the Department of Treasury, has provided a very complete and excellent description of the historical financial indices for the oil and gas industry. As Mr. Sunley points out, the financial data for the industry as a whole is difficult to relate directly to oil and gas exploration and development because of the wide range of activities of the integrated firms and the inability precisely to disaggregate such factors as profitability, debt-equity ratios, and cost of capital.

Fortunately, however, the historical record of direct expenditures for oil and gas exploration and development is documented by the Department of Commerce, Annual Survey of Oil and Gas, and the industry-sponsored Joint Association Survey. Those cost and expenditure data, along with projected levels of production and the revenues that will be received therefrom, can be extrapolated into the future with reasonable confidence levels. That data supports projections of revenues, exploration and development expenditures, tax consequences, and net cash flow positions for that segment of the industry that is engaged in conventional oil and gas exploration, development, and production. To be sure, projections of the future in this area must be allowed a range of variability to cover uncertainties. But, the uncertainty is focused upon the discrete production-related activities of the industry, rather than on difficulties in precisely disaggregating total industry financial data.

The Department of Energy and several other groups and institutions, over the past two years, have analyzed this data and made projections of the capital requirements of the petroleum production industry for the next several years—typically through 1985.

There is unanimous agreement from these studies that the future capital requirements of the domestic oil and gas industries will be great—on the order of \$200 billion (1979 dollars) or more through 1985. There are diverse opinions, however, regarding the precise magnitude of these requirements, the role that cash flow will play in determining the level of exploration and development, the methods by which new projects will be financed, and the ability of the industry to obtain necessary capital.

In an endeavor to reconcile or explain these various conclusions regarding capital needs and capital sources of the petroleum industry, DOE in mid-1978 commissioned a study by ICF, Incorporated (hereafter referred to as the ICF study) to analyze and compare the Administration's estimates for the first National Energy Plan with the conclusions contained in six major analyses by persons outside the Federal government. That study is in the process of being completed and has not been evaluated within the Department of Energy at this time. Currently, three volumes are bound in final draft form. Volume 1, the Executive Summary, and Volume 5, the Pro Forma Financial Projections, are in preliminary draft form. However, I will discuss the general conclusions of the draft report and briefly relate those conclusions to the President's crude oil pricing program.

The recent private studies that were evaluated in the ICF study were performed by the Chase Manhattan Bank, Standard Oil Company of Ohio (Sohio), the Council of Energy Resources of the University of Texas (CERUT), Bankers Trust Company, C. H. Keplinger, and the Independent Producers Association of America (IPAA). Each of these studies was developed with different frames of reference and with different objectives but the principal results of these studies<sup>1</sup> may be summarized as follows:

<sup>1</sup> The Bankers Trust and Keplinger studies cannot be directly related to this format. Bankers Trust covered only the years to 1982. Keplinger estimated a finding cost per barrel but did not make an econometric analysis of industry expenditures.

	Average annual productivity (BOE/feet) <sup>1</sup>	Cumulative drilling footage (including dry holes) (millions of feet)	Projected E. & D. expenditures (billions of 1979 dollars) total	Total reserves added (billions of BOE)
DOE (1978-85).....	24.0	1,930	\$205	50.7
Chase (1978-85).....	19.6	2,823	317	55.3
IPAA (1977-85).....		2,943	314	58.2
SOHIO (1977-85).....		2,401	241	63.4
CERUT (NEP Case) (1977-85).....	15.0	1,800	223	29.9

<sup>1</sup> Barrels of oil equivalent of reserves of oil, natural gas, and natural gas liquids added per year divided by total drilling footage in the year.

These diverse results suggest fundamental differences in assumptions regarding the factors that influence capital expenditures by the oil and gas industry. For example, the Chase study assumed that each barrel of production should be replaced by a barrel of reserves and that the industry would drill enough wells to reach that target. The IPAA study assumed a production target sufficient to reduce projected oil imports to a given level. Neither study indicated how the industry could drill 2.8 or 2.9 billion feet of profitable prospects in eight or nine years, which would require drilling 50 percent higher than the very high 1978 level. SOHIO used the NEP 1985 projected production as a base, but held constant the reserve to production ratio, which significantly increased reserve addition "requirements." The low productivity assumed in the CERUT model coupled with the CERUT-perceived inadequacy of the NEP prices led to a projection of less drilling and fewer reserves added.

In the final analysis, it would appear that the most important factor in determining the future investment levels of the oil and gas industry is the extent, quality, and accessibility of the remaining oil and natural gas resource base. At any given level of oil prices, there is a finite number of projects that can be developed and produced profitably by the industry. The oil and gas industry is not basically eleemosynary in nature nor is it organized merely to drill holes in the earth. It cannot be expected that the industry will blindly invest in exploration and drilling when anticipated profit cannot be projected to meet acceptable levels, regardless of the extent of available cash flow to fund such activity. Therefore, it is essential that a realistic assessment of future drilling prospects underlie a projection of cash flow requirements and E&D investment activities of the industry.

For these reasons, the Administration's original NEP analysis, the ICF study, and current DOE analyses are founded upon U.S. Geological Survey resource base estimates and assume that expected rate of return from new oil and gas projects is the critical determinant of the level of future capital investment in domestic oil and gas production. The DOE/EIA Midterm Oil and Gas Supply Model projects domestic oil and natural gas production from analysis of geological, economic, and engineering factors which affect oil and gas supply.

The DOE/EIA Oil and Gas Model has three major interconnected submodels. First, a Drilling Submodel develops information about the economic gradations of the resource base. The extent of the resource base is defined principally by the U.S. Geological Survey Circular No. 725, a 1975 estimate of remaining recoverable reserves of oil and gas. Second, a Resource Submodel translates exploratory drilling, the prospects for finding oil, the intensity of development, the fraction of oil-in-place which can be recovered by either primary, secondary, or tertiary methods, and the fraction of proved reserves which can be produced each year into annual production quantities by region. Third, an Economic Submodel calculates a minimum acceptable price for each year's quantity of reserves proved.

A hypothetical project, either exploratory or developmental, is included in the DOE forecast of production in a future year only if the minimum acceptable price is less than or equal to the expected future market price. Through this process of projecting drilling activity and production, an estimate of industry capital requirements can be developed.

The most significant variables in the DOE assessment of future capital requirements are:

- Quality and accessibility of the resource base.
  - Productivity (finding rate of BOE/ft. drilled).
  - Drilling costs per foot drilled.
  - Lease acquisition costs.
  - Required rate of return on investment (discount rate).
- I will discuss these variables briefly.

## ACCESSIBILITY OF THE RESOURCE BASE

The DOE Model currently uses the 1975 USGS Circular 725 to estimate the remaining resource base. If the USGS estimate is too pessimistic, there may be a greater number of profitable drilling opportunities at any given productivity or price level and therefore projected E&D expenditures would be higher. However, Circular 725 is generally regarded as falling within a reasonable range.

The DOE Model also uses the current DOI OCS leasing schedule of four to five sales per year to estimate accessibility of the resource. The President has directed that additional acreage be added to the current OCS leasing schedule. If Federal OCS lease sales are accelerated, for example to six or seven per year, and if NPR-A is opened for private leasing and development, the accessible portion of the resource base would increase significantly. It is not likely, however, that these actions would greatly affect industry E&D expenditure before the mid-1980's because of the long lead times required to develop new areas. In any event, DOE foresees no capital constraints that would prevent the oil and gas industry from responding to an accelerated leasing schedule.

## PRODUCTIVITY

Productivity (or finding rate per foot drilled) is a most significant factor in the cost of finding and producing crude oil or natural gas.

Since 1973, there has been a strong upturn in oil and drilling activity in the United States (Appendix A). The number of active rotary drilling rigs has doubled and total drilling footage has increased by 50 percent (Appendix B). Despite the increase in drilling, the rate of additions to the oil and gas reserves per foot drilled has trended sharply downward. The finding rate of oil and gas per foot drilled has declined from a high of 53 BOE/ft. in 1967 to a low of 18 BOE/ft. in 1977, and 16 BOE/ft. in 1978 (Appendix C). Reasons for the rate of decline are difficult to substantiate at this time. Two possible theories have been advanced and were analyzed by the ICF study.

There has been more intensive development of existing fields to enhance production and the industry is developing previously by-passed lower quality deposits with lower productivity in response to the sharp price rises in 1973 and 1974.

There has been a permanent transition to a lower quality plateau in the resource base.

The first theory supports a view that, in due course, overall productivity will increase as industry returns to a higher degree of exploratory drilling. Exploratory drilling historically has yielded significantly higher productivity and has not declined as substantially as overall productivity in recent years (Appendix D).

The DOE/EIA model derives productivity projections from regression analysis of 20 years of data, which minimizes the impact of the sharp downturn in recent years. As a result, the DOE/EIA model projects an average productivity of 24 BOE/ft. from 1978 to 1985, which, of course, is considerably higher than actual experience in the past few years. If the first theory regarding the recent productivity downturn, which is the more plausible, is the more accurate, the DOE/EIA estimate will in the long-run prove to be basically valid.

Nevertheless, consequences of lower future productivity upon industry investment requirements must be considered. It has been argued that if productivity is in fact lower than DOE projects, the industry will be required to make even greater expenditures for exploration and development in the future. The argument presupposes that the industry has specific production targets and will drill to whatever extent and at whatever cost is necessary to achieve that level of production. In fact, however, the industry responds principally to prospective marginal returns on investment and lower productivity could merely mean lower E&D expenditures, higher cash flow, and lower future production. The industry cannot reasonably be expected to invest more capital in drilling projects which are, overall, less financially attractive.

On the other hand, to the extent that industry views cash flow as lower cost capital than new debt or equity, it is conceivable that increased cash flow would moderately support a maintenance of E&D expenditure levels in the face of lower productivity.

## DRILLING COSTS

The DOE/EIA model assumes that drilling costs per foot will remain constant in real terms over time but overall unit drilling costs will increase as the average depth of wells increases to recover deep hydrocarbon deposits. Drilling costs constitute approximately 50 percent of E&D expenditures and errors in projection of the per foot cost would have significant effects on overall costs. However, like lower productivity, higher drilling costs would tend to make new investments less profitable and should not result in an overall increase in exploration and development expenditures.

## LEASE ACQUISITION EXPENDITURES

Industry lease acquisition expenditures have fluctuated widely in recent years. The amount in any given year has reflected in large measure the amount and quality of Federal Outer Continental Shelf acreage leased in that year.

## LEASE ACQUISITION EXPENDITURES

[In millions of current dollars]

	1971	1972	1973	1974	1975	1976	1977
Average expenditures (appendix F).....	642	1,722	3,552	5,774	1,615	3,024	2,587
OCS acreage leased (thousands of acres).	37	826	1,033	1,762	1,680	1,278	1,101

Another important factor in determining the amount of lease acquisition expenditures is the expected revenue from the lease. A company will not bid more for a lease than it can expect to recover from production. Thus, while lease acquisition (or bonus payment) costs are deducted from industry revenues to determine cash flow, it is important to note that they are totally variable in response to an assessment by the industry of future prices of oil and gas and quality of the prospect. Lease acquisition expenditures distribute a share of the economic "rents" to the landowner—principally the U.S. government—but they do not significantly affect long-run profitability of the industry unless the industry becomes particularly inept at estimating these prospects.

The ICF study projects future lease acquisition costs as follows (in billions of dollars) (Appendix E):

1979.....	5.1
1980.....	5.0
1981.....	5.2
1982.....	5.7
1983.....	6.1
1984.....	5.7
1985.....	4.9

## REQUIRED RETURN ON INVESTMENT

The DOE/EIA model assumes that the minimum required discounted cash flow (DCF) return on investment for oil and gas E&D is 8 percent real (15 to 18 percent nominal at current inflation rates). If a lower DCF return is acceptable to the industry, E&D requirements would be projected to increase since there would be a larger selection of profitable projects in the resource base. The ICF study projects that a 6 percent return requirement would increase E&D expenditures by a total of \$23 billion (a 12 percent increase) from 1978 to 1985, compared with an 8 percent discount rate.

## CONCLUSIONS

The basic conclusion that can be drawn from the ICF study is that the oil and gas industry will have adequate cash flow through 1985 to finance projected exploration and development expenditures. I have included a sample Pro Forma Financial Sheet for the industry from the ICF study to illustrate the process (Appendix E). The ICF study, of course, does not reflect such factors as the latest increases in world oil prices or the President's program for decontrol of

domestic prices. The ICF analysis was based upon a landed price of imported crude oil in the U.S. of \$14.50 per barrel in 1978 dollars (approximately \$15.50 in today's dollars) compared with a probable average price of \$18.00 or more by mid-1979. Higher world oil prices for marginal production will tend to increase oil and gas E&D expenditures. But, higher prices provide both greater cash flow from decontrolled domestic oil and Alaska North Slope oil and also provide greater incentives for new investment in the oil and gas industry from external sources. Also, the crude oil pricing provisions of the President's program will increase revenues to the industry somewhat above the levels assumed in the ICF study.

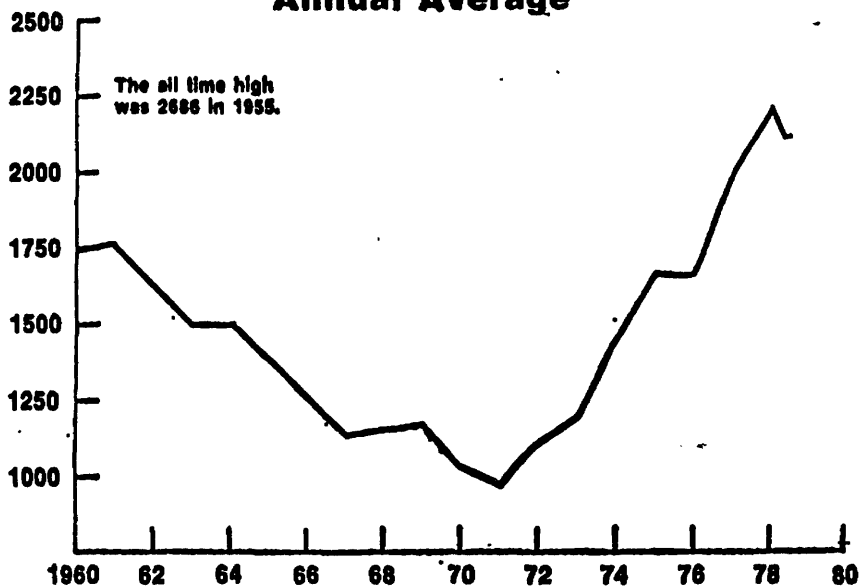
There have been suggestions that the oil and gas industry will need significantly high revenues and cash flow to enable it to undertake an aggressive campaign to locate new conventional oil and gas resources. Such contentions are contradicted by sound investment theory and by the conclusions that can be drawn from the ICF study. The ICF study examined how capital expenditures on oil and gas exploration and development are influenced by changes in cash flow and whether those capital expenditures have been financed by debt. In general, an extremely low correlation was found between cash flow and capital expenditures by the 25 companies examined. The study also indicates that capital expenditures on oil and gas exploration have been financed to a significant degree by debt, i.e., external financing.

In conclusion, it is important to stress that the returns on future investment are the basic determinant of industry capital expenditures. If, in the remote event that oil and gas industry cash flow is not adequate to cover new investments, future profitability of attractive investments will enable the existing members of the industry to raise capital externally. Equally importantly, future returns will lure new entrants to the industry and increase competition; further cash flow increases from existing oil will not.

Thank you, Mr. Chairman, for this opportunity to appear before this Committee. I would be pleased to answer any questions.

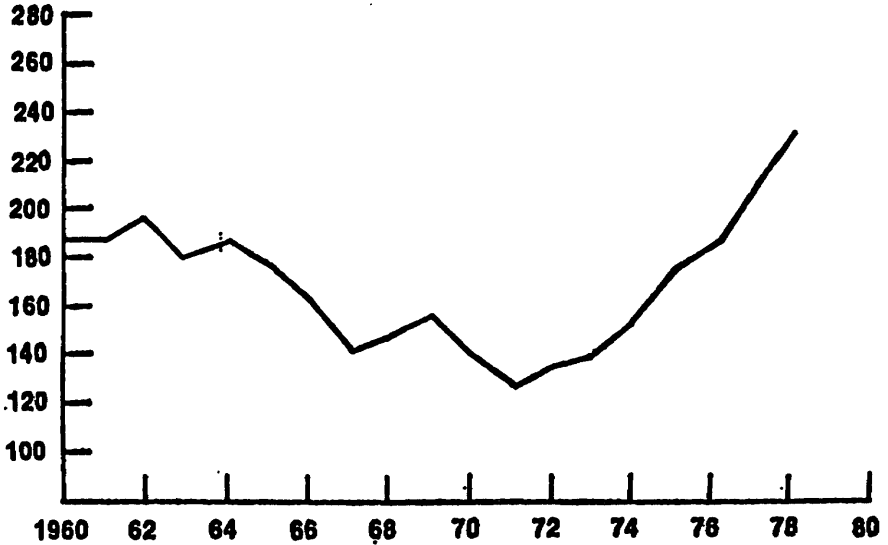
## Rotary Drilling Rigs in Operation Annual Average

APPENDIX 'A'



TOTAL OIL AND GAS DRILLING FOOTAGE  
(IN MILLIONS OF FEET)

APPENDIX B

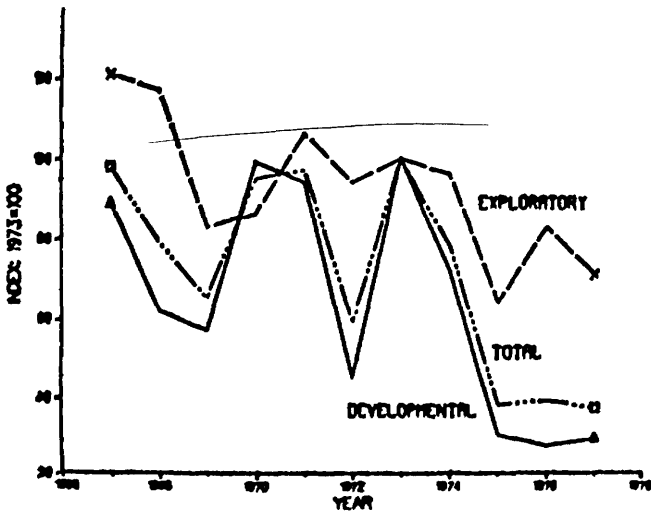


## APPENDIX C

## OIL AND GAS DRILLING PRODUCTIVITY

Year	Footage drilled (mmf)	BOE/foot drilled
1960	186	28
1961	186	33
1962	194	32
1963	180	33
1964	186	36
1965	177	42
1966	162	43
1967	141	53
1968	145	37
1969	157	24
1970	139	38
1971	124	35
1972	137	26
1973	139	27
1974	153	26
1975	176	21
1976	184	17
1977	213	18
1978	232	16

APPENDIX D  
OIL AND GAS DRILLING PRODUCTIVITY



BEST COPY AVAILABLE



APPENDIX E  
PRO FORMA FINANCIAL STATEMENT  
[In millions of 1979 dollars]

	1978	1979	1980	1981	1982	1983	1984	1985	1978-85
<b>E. &amp; D. EXPENDITURES</b>									
Gas plant.....	89.9	156.7	142.5	143.8	142.5	134.8	113.0	83.5	1,006.7
Geology/geophys.....	301.4	337.3	361.7	386.1	1,015.6	1,050.3	1,065.7	1,059.3	7,977.4
Lease acquisition.....	4,691.7	5,165.5	5,034.6	5,206.6	5,767.7	6,115.7	5,704.8	4,907.5	42,594.1
Miscellaneous.....	404.5	425.0	437.8	450.7	464.8	477.7	480.2	475.1	3,615.8
Equipment.....	1,765.5	1,841.3	1,893.9	1,953.0	2,022.3	2,085.2	2,107.0	2,091.6	15,759.8
Tangible drilling.....	3,998.4	4,134.5	4,388.7	4,713.6	5,057.7	5,151.4	4,847.1	4,609.6	36,901.0
Capitalized expenditure.....	11,851.4	12,660.3	12,859.2	13,453.8	14,470.6	15,015.1	14,317.8	13,226.6	107,854.8
Dry holes.....	3,415.4	3,536.1	3,608.0	3,638.9	3,708.2	3,843.0	3,949.6	3,941.9	29,641.1
Intangibles.....	5,553.3	5,780.6	5,950.1	6,136.2	6,358.4	6,549.7	6,426.4	6,341.7	49,096.4
Lease rentals.....	494.3	514.9	527.7	540.6	557.3	576.5	584.2	581.7	4,377.2
Overhead.....	1,506.1	1,566.5	1,607.6	1,646.1	1,697.5	1,753.9	1,779.6	1,769.4	13,326.7
Expensed portion.....	10,969.1	11,398.1	11,693.4	11,961.8	12,321.4	12,723.1	12,729.8	12,634.7	96,441.4
Total E. & D.....	22,820.5	24,058.4	24,552.6	25,415.6	26,792.0	27,738.2	27,057.6	25,861.3	204,296.2
<b>OPERATING STATEMENT</b>									
Gross revenues.....	57,642.6	60,758.9	63,660.7	66,463.7	69,664.7	72,710.1	75,639.2	81,727.9	548,268.1
Ad Va/srv tax.....	2,867.2	3,013.6	3,147.1	3,266.5	3,360.2	3,412.9	3,437.3	3,746.7	26,251.5
Royalties.....	7,629.5	8,007.0	8,362.7	8,714.5	9,135.7	9,551.7	9,961.3	10,768.9	72,131.3
Net revenues.....	47,145.9	49,738.3	52,150.9	54,482.7	57,168.8	59,745.8	62,240.6	67,212.3	449,885.3
Gas plant.....	472.5	461.0	454.5	449.4	449.4	446.8	445.6	443.0	3,622.2
Geology/geophys.....	556.0	575.2	590.6	604.8	618.9	635.6	649.7	660.0	4,890.8
Miscellaneous.....	3.9	3.9	3.9	3.9	3.9	5.1	5.1	5.1	34.8
Overhead.....	999.0	1,033.6	1,070.9	1,111.9	1,129.9	1,155.6	1,150.5	1,154.3	8,805.7
Interest.....	186.2	196.5	200.3	208.0	219.6	227.3	220.9	211.9	1,670.7
Prod wells.....	6,956.7	7,214.8	7,420.2	7,709.1	7,906.9	8,122.6	8,317.8	8,523.2	62,171.3
Depreciation.....	2,885.2	3,360.2	3,816.1	4,266.7	4,681.5	5,128.3	5,539.2	5,901.3	35,578.5
E. & D. expensed.....	10,969.2	11,398.1	11,693.4	11,961.7	12,321.3	12,723.2	12,739.9	12,634.6	96,441.4
Total expenses.....	23,028.7	24,243.3	25,249.9	26,315.5	27,331.4	28,444.5	29,068.7	29,533.4	213,215.4
Profit before tax.....	24,117.2	25,495.0	26,901.0	28,167.2	29,837.4	31,301.3	33,171.9	37,678.9	236,670.9
Income tax.....	12,058.0	12,747.6	13,449.9	14,082.9	14,918.8	15,650.7	16,585.4	18,838.9	118,332.2
Irry tax credit.....	-625.3	-654.8	-686.9	-548.3	-576.5	-584.2	-550.8	-521.3	-4,748.1
Profit after tax.....	12,684.5	13,402.2	14,138.0	14,632.6	15,495.1	16,234.8	17,137.3	19,361.3	123,088.8
Withholds.....	13,854.4	14,758.3	15,509.4	16,228.5	17,002.7	17,851.5	18,279.0	18,535.8	132,019.6
Gross cash flow.....	26,538.9	28,160.5	29,647.4	30,861.1	32,497.8	34,086.3	35,416.3	37,897.1	255,106.4
Dividends.....	3,608.0	3,828.9	4,031.8	4,196.1	4,419.5	4,635.2	4,816.3	5,154.0	34,689.8
Net cash flow.....	22,930.9	24,331.6	25,615.6	26,665.0	28,078.3	29,451.1	30,600.0	32,743.1	220,416.6
Total E. & D.....	22,820.5	24,058.4	24,552.6	25,415.6	26,792.0	27,738.2	27,057.6	25,861.3	204,296.2
Available for other uses.....	110.4	273.2	1,063.0	1,249.4	1,286.3	1,712.9	3,542.4	6,881.8	16,120.4

## APPENDIX F

## OIL AND GAS EXPLORATION, DEVELOPMENT, AND PRODUCTION EXPENDITURES

(In millions of current dollars)

	1973	1974	1975	1976	1977
<b>1. Exploration:</b>					
Drilling and equipping wells.....	1,151.5	1,904.2	2,528.8	3,008.7	3,670.3
Lease and land acquisitions.....	3,552.0	5,774.0	1,614.5	3,024.3	2,587.1
Land department leasing and scouting.....	93.3	109.2	135.0	154.0	196.6
Geological and geophysical.....	487.2	683.9	777.1	844.3	972.8
Lease rents.....	183.8	214.2	243.7	252.1	279.3
Test hole contributions.....	16.8	10.7	20.1	26.5	37.2
Other exploration expenditures.....	129.3	203.1	288.1	293.4	348.8
G. & A. overhead not reported elsewhere.....	248.3	350.5	406.8	493.7	480.0
<b>Total exploration.....</b>	<b>5,862.2</b>	<b>9,249.8</b>	<b>6,014.1</b>	<b>8,097.0</b>	<b>8,560.0</b>
<b>2. Development:</b>					
Drilling and equipping wells.....	2,154.6	2,729.2	3,993.6	5,066.3	6,435.6
Lease equipment.....	687.8	982.9	1,785.2	1,813.2	1,833.5
Lease and land acquisitions.....	183.1	474.0	303.4	381.4	273.1
Fluid injection and improved recovery and other development expenditures.....	429.9	753.5	1,105.8	1,655.2	1,288.3
G. & A. overhead not reported elsewhere.....	200.7	270.4	400.1	432.7	436.6
<b>Total development.....</b>	<b>3,706.3</b>	<b>5,220.0</b>	<b>7,588.1</b>	<b>9,348.8</b>	<b>10,267.1</b>
<b>3. Production:</b>					
Operating and maintenance.....	2,071.2	2,577.1	3,140.0	3,647.2	4,236.9
Well workovers.....	341.6	441.3	530.5	577.2	688.9
Other direct expenses.....	180.7	228.0	282.4	283.0	326.2
Traces (including income).....	924.6	1,534.1	1,748.1	1,897.9	2,100.1
G. & A. overhead.....	496.8	601.4	768.8	865.5	905.9
Other indirect expenses.....	193.5	252.1	358.0	369.1	435.7
<b>Total production.....</b>	<b>4,208.4</b>	<b>5,634.0</b>	<b>6,825.8</b>	<b>7,639.9</b>	<b>8,703.7</b>
<b>Total expenditures.....</b>	<b>13,776.9</b>	<b>20,103.8</b>	<b>20,428.0</b>	<b>25,085.7</b>	<b>27,530.8</b>

Source: Department of Commerce "Annual Survey of Oil and Gas" data is adjusted to reflect interests other than working interests.

[Whereupon, at 12:30 p.m., the subcommittee recessed, to reconvene at the call of the Chair.]

## CRUDE OIL SEVERANCE TAX

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FRIDAY, MAY 11, 1970

U.S. SENATE,  
SUBCOMMITTEE ON ENERGY AND FOUNDATIONS,  
COMMITTEE ON FINANCE,  
*Washington, D.C.*

The subcommittee met, pursuant to recess, at 9:55 a.m., in room 2221, Dirksen Senate Office Building, Hon. Mike Gravel (chairman of the subcommittee) presiding.

Present: Senators Gravel, Baucus, Boren, Packwood, Chafee, and Durenberger.

Senator GRAVEL. The hearing will come to order. This is the second day of hearings that we are having on the energy policy of the United States, particularly on the issues raised in the President's new policy with respect to the deregulation of oil and with the request on his part for the creation of a windfall profits tax.

Earlier, this week, Monday, we have had testimony from the administration; today, we will receive testimony from the private community, both the business community and academia, so that we can develop a macroconcept and broad knowledge with respect to the issue.

So often in Congress we take the short run or get lost in minutiae. These are positioning hearings. When the legislation comes over from the House, I am sure there will be precise hearings on the specificity of the legislation and questions by the full committee. These are the hearings that will really define the parameters of the problem and hopefully give some guidance to the solution.

I am very happy to see that we have some distinguished persons on the hearing panel. One is Professor Forrester, whom I had the occasion to meet some time ago. I am most pleased to have you here, sir.

Then we have Dr. Anthony Copp. Doctor, it is a pleasure having you here from Salomon Bros. Dr. Forrester is from NIT.

James P. Wallace, Energy Economic Division of the Chase Manhattan Bank and Dr. Jack Carlson, chief economist of the Chamber of Commerce of the United States. Very good. It is an excellent panel.

Why do we not start with Mr. Copp and present your testimony. We will withhold our questions and go through all of your statements. Then we will be able to engage in a colloquy with all of you and all of us here on the Senate panel.

On the Senate side, we will have the early bird rule. The first ones here were Senator Chafee and myself, and then the Senator from Oregon and any other Senators who come in. We will try to limit our questions on the first round to 10 minutes each. Then we will do a round robin so that everybody gets a chance, rather than what

happened last Monday where the minority got short shifted on the questions.

Would you please proceed?

**STATEMENTS OF RONALD M. FREEMAN, VICE PRESIDENT AND DR. E. ANTHONY COPP, VICE PRESIDENT, SALOMON BROS.**

Mr. COPP. Thank you, Senator. I would like to note that Mr. Ronald M. Freeman, vice president and manager of our energy group at Salomon Bros. is also here with me and we have submitted our testimony jointly.

I would like to first describe my functions and explain why I am involved in this activity; then I will give the microphone over to Mr. Freeman, who will read the initial part of our presentation.

As head of energy research, I visit institutions around the world involved in the energy business advising them as to the allocation of their funds on the equity side.

Senator CHAFEE. Mr. Chairman, I cannot hear very well.

Mr. COPP. I get involved in institutions around the world in this country and foreign countries as to investing in the energy business. With that, I will give it over to Mr. Freeman.

Mr. FREEMAN. Thank you, Dr. Copp.

Mr. Chairman and members of the subcommittee, our purpose today is to respond to your invitation to provide to this subcommittee Salomon Bros.' viewpoint as investment bankers on the subject of oil company profitability.

As you know, Mr. Chairman, my colleagues from Salomon Bros. and I appeared before the Senate Finance Committee to provide testimony on financial aspects of the Energy Tax Act of 1977. At that time, we presented certain financial data prepared by Salomon Bros. concerning the ability of 35 leading petroleum companies to implement national energy goals with regard to developing this Nation's indigenous energy resources and to reducing the level of its oil prices.

Accordingly, you have kindly invited us to appear before this subcommittee to review the financial data which we presented at that time, to update it and then to discuss the effects of the administration's current energy tax proposals on the financial capabilities of the petroleum industry and its ability to continue to realize these increasingly urgent, national energy goals.

In preparing our testimony, we have carefully reviewed the summary description of the windfall profits tax as released by the President on April 26, along with the President's comments regarding this proposal at the time of its release and subsequent thereto. In considering these comments as well as those made by other administration spokesmen, certain Members of Congress, industry representatives and petroleum analysts, we again took note of the fundamental conflict of objectives which characterized the current administration energy initiatives.

Specifically, we refer to the apparent desire, on the part of the administration, to:

Increase U.S. energy independence while weakening U.S. energy companies.

Find more U.S. oil reserves while reducing both economic incentives and funds available for oil exploration.

End oil price control at the consumer level while perpetuating it with respect to the producers.

Treat supply/demand factors affecting oil industry profitability as the source of "unearned, unnecessary and unjustified profits" while withholding such characterization from the full range of all the world's other goods and services, the profitability of which is similarly subject to such risks.

In our opinion, these conflicting objectives continue to infect the national energy debate because of the scarcity of facts which have been allowed to enter the discussion and challenge the costly phenomenon of objectives in conflict.

Therefore, it is our purpose today, in response to your invitation, to provide the results of our analysis of industry financial data, compiled by ourselves from public sources, and supplemented by certain operating data concerning oil industry capital expenditures and exploration programs.

We have employed the same methodology as that adopted in our previous testimony before the Senate Finance Committee and have carried out a consolidation of certain financial data published by 33 oil companies ranging from the very largest to middle-sized exploration and production entities.

We have provided the entirety of this data as an enclosure to the present testimony as part of the record at the present hearings of this subcommittee.

As requested by the subcommittee, I will begin by reviewing the key findings of our analysis as they stood at the time at which we provided our testimony in 1977 and update them to the present time.

For that period, our analysis—adjusted for two companies eliminated by acquisition and reclassification as a utility—shows that while oil industry net income increased by some \$5.8 billion between 1971 and 1976, oil company capital expenditures increased by \$12.4 billion or two times more than net income.

Updating this figure to the most recent period, the net income of the companies in our sample has increased from \$12 billion in 1976 to \$13.7 billion in 1978, or some \$1.7 billion, while capital expenditures increased from \$22.5 billion to \$25.7 billion for a gross increase of \$3.2 billion, or more than 180 percent of the increase in net income. In 1978, the oil industry made capital expenditures of \$1.87 for every dollar of net income received.

Of course, oil companies, like other corporations, are able to draw on other sources of internal funds than net income for their capital expenditure programs. The most commonly used financial concept to describe the net funds available to corporations from internal sources is retained cash flow.

Retained cash flow is the sum of net income and return of capital on other investments through depreciation and amortization less dividend payments to shareholders. To the extent that a corporation is able to maintain a level of capital expenditures equal to or less than its retained cash flow, that corporation will be able to finance the new plant, property and equipment required for its growth without relying upon the costs and risks of accessing external capital.

Therefore, we analyzed the respective levels of retained cash flow and capital expenditures for the 33 companies in our sample. The

result of this inspection revealed that in only one year, 1973, during the 1971 through 1978 period was the oil industry able to generate retained cash flow in excess of its capital expenditure program.

In every other year capital expenditures significantly outpaced retained cash flow leaving the companies with a net deficit to be financed from external sources. The annual capital expenditures in excess of retained cash flow have ranged from a low of \$76 million in 1974 to a high of \$6.5 billion in 1975 for a total deficit of \$16.9 billion during this 8-year period.

In order to finance this deficit of capital expenditures relative to retained cash flow, to pay back maturing long-term debt and to maintain working capital at acceptable levels, the oil companies in our analysis raised more than \$46.3 billion during the 1971 through 1978 period by the issuance of long-term debt and new equity.

More than 28 percent of this total amount, or \$13.1 billion of external capital, was raised in the two years 1977 and 1978. It would respectfully submit that this degree of dependence on external funds for normal business purposes is not consistent with the "awash in cash flow" characterization which has been frequently ascribed to the oil industry by certain administration spokesmen.

This industry dependence on external capital, particularly debt, to finance a significant proportion of its capital expenditures and other requirements in excess of retained cash flow, has resulted in a progressive erosion of the key credit ratios including retained cash flow to long-term debt and debt to total capitalization for many of the companies in our analysis. For example, in 1971, 15 of the 33 companies in our sample had debt in their capital structure in excess of 30 percent of total capitalization. By 1978, this proportion had increased by more than 25 percent when 19 of the 33 companies showed debt in excess of 30 percent in their capital structures.

Corporate managers are required to control these credit ratios in order to protect the creditworthiness and profitability of their companies. To the extent that growth in retained cash flow lags because of market factors, price controls or special tax measures, then the stewards of these key credit ratios, will be required to reduce capital expenditures and exploration programs accordingly in order to maintain these ratios within acceptable bounds thus protecting their investors' capital and their employees' jobs.

Equity investors have reflected their concern about the ability of oil companies to contend successfully with the market, geological, and foreign and domestic political risks which affect their profitability. These equity investors are, in fact, to a very significant degree, professional fiduciaries employed by banks, insurance companies and mutual funds to manage the savings and pension assets entrusted to these institutions by millions of Americans. According to data compiled by Salomon Bros., oil and oil-related stocks currently represent between 6 and 9 of the top 25 stock holdings of these institutions.

During the 20 months which have elapsed since we last appeared before the Senate Finance Committee, 12 of the 33 companies in our sample have seen their stock prices decline or remain at their September 1977 level. Another six companies in the sample have seen their stock prices appreciate at an annual rate of less than 5 percent per year, or less than one-half the prevailing rate of inflation of the Consumer Price Index during the 1977 to 1979 period.

The companies whose stocks have performed best are those which have demonstrated an ability to explore for new oil and gas both massively and effectively. This was so for the 1971 through 1976 time-frame which we considered in our previous appearance and it is equally true for the 1976 through 1978 period which has since elapsed.

Professional fiduciaries and individual investors have favored and continue to favor the oil companies with active, successful exploration programs, while discounting the securities of integrated companies whose ability to earn an economic return on refining and marketing assets has been severely compromised by Government price regulation and market factors.

As a result, the average price earnings ratio of oil companies concentrating on exploration and production and doing so successfully, currently averages some 14 times annualized earnings or more than twice the average price earnings ratio of the integrated oil companies.

Given the investor preference for companies which can find new oil and gas reserves effectively, it is appropriate then to ask whether the companies have heeded this message by concentrating their capital expenditure programs on drilling and exploration. Our analysis of data compiled by both Government and industry sources indicates that, to an overwhelming degree, exploration is by far the single largest use of oil company capital expenditure budgets in the United States.

Based on information drawn from the Department of Commerce annual survey of oil and gas industry spending and the joint association survey produced by the American Petroleum Institute, we find that domestic producing companies reinvested or "plowedback" 96 percent of their wellhead—as distinguished from final product sales—revenues into oil and gas exploration in 1977. Major, integrated companies, who must balance their oil and gas exploration investments with investments in downstream refining, marketing, and transportation assets, reinvested 67.4 percent of their 1977 wellhead revenues in oil and gas exploration.

Given the investor preference for companies which can find and prove new oil and gas reserves effectively, it is appropriate then to ask whether the companies have heeded this message by concentrating their capital expenditure programs on exploration and development. Our analysis of data compiled by both Government and industry sources for the 1973-77 period indicates that exploration and development expenditures in the United States have equaled nearly twice the costs of production.

To what extent did the oil companies increase their investment in the upstream activities of exploration, development, and production relative to their net income and retain cash flow?

To answer this question, we reviewed the data for 1973-77 compiled by the Department of Commerce in its annual survey of oil and gas. A summary of these data follows:

[In billions of dollars]					
Type of expenditure	1973	1974	1975	1976	1977
Exploration.....	5.4	8.7	5.3	7.2	7.8
Development.....	3.0	4.4	6.4	7.7	9.1
Production.....	4.2	5.6	6.8	7.6	8.7
<b>Total.....</b>	<b>12.7</b>	<b>18.7</b>	<b>18.6</b>	<b>22.6</b>	<b>25.6</b>

From this data we observed the following:

First: These "upstream" expenditures, totalling nearly \$100 billion, more than doubled between 1973 and 1977 while industry net income increased by less than one-third and retained cash flow by some 45 percent.

Second: Exploration expenditures have averaged 35 percent of this total budget; in the aggregate, for each dollar distributed as dividends to shareholders, the oil companies in our sample invested more than \$1.65 in exploration, alone, and more than \$4.70 per \$1 of dividends in all upstream activities.

Third: The fastest growing element of exploration as distinguished from development and production expenditures was the cost of drilling and equipping wells. These expenses rose from \$944 million in 1973 to \$3.2 billion in 1977, an increase of over 340 percent during the period. Drilling and equipping expenses are comprised of dry holes, oil and gas exploratory wells and various work in progress adjustments. The largest of these items, dry hole expense, more than tripled during the period from \$558 million in 1973 to \$1.6 billion in 1977.

Fourth: Development expenditures also tripled during this period, growing from \$3 billion in 1973 to \$9.1 billion in 1977. While actual expenditures of drilling and equipping wells accounted for most of this increase in development expenditures, lease equipment, fluid injection and improved recovery techniques have also been major sources of increased development costs. Having grown more than 2.3 times as fast as net income, development expenditures, alone, account for nearly one-half the total growth in exploration, development, and production expenditures during this period.

In our judgment, these data clearly show the propensity of the petroleum industry to reinvest its cash flow in finding, developing, and producing activities and to increase its spending for oil and gas exploration and development at rates greater than the overall growth of net income and retained cash flow.

However, the level of exploration expenditures sustainable by oil producers is determined not by the willingness of third-party investors to provide external funds to companies, but by the ability of companies to generate adequate funds internally. Exploration is universally acknowledged in the oil industry and in the investment community to be the riskiest of all oil company activities. Consequently, it is the activity uniquely funded by equity capital, whether provided by equity investors or by retained cash flow. Because of the limited amount and high degree of equity capital currently available for new ventures in the United States, whether in the oil and gas industry or elsewhere, oil producers are overwhelmingly dependent on their ability to generate adequate levels of internal cash flow in order to maintain a growing exploration program. Because cash flow is generated primarily by retained earnings, oil product prices, net of taxes, become the single most important factor in enabling oil producers to fund growing exploration programs while maintaining credit ratios and net income at levels consistent with the requirements of the investment community.

At this point, I would like to turn the podium over next to my colleague, Dr. Anthony Copp, to complete our formal statement. Thank you.



Mr. COPP. Thank you.

We have noted that previous witnesses before this subcommittee have claimed that the principal constraint on oil company exploration expenditures is not money but drilling equipment. This is simply not supported by the facts.

On the contrary, the drilling industry, too, has shown its responsiveness to the existence of economic incentives in the form of higher product prices. Thus, leadtime for drilling equipment have declined dramatically even within the last year from as much as 18 months to a present average of 60 to 90 days.

We anticipate that drill rig availability will probably increase by an additional 500 rigs by the end of 1979 from its present level of around 2,350 units.

Senator GRAVEL. Do we have your statement here?

Mr. COPP. It is on page 8, Senator, the middle of page 8.

Indeed, if there is a nonmonetary constraint to the level of drilling activity, other than the availability of attractive, drillable sites, it is the waiting period required to secure drilling permits. For example, we understand that currently a 5-to-6-month period is required to secure drilling permits. For example, we understand that currently a 5-to-6-month period is required to secure a Corps of Engineers permit for drilling on an offshore lease. Clearly, to the extent that Government seeks to encourage an acceleration in U.S. drilling programs, such Government imposed bottlenecks must be removed and the Department of Energy and the Department of Interior encouraged to expand more rapidly the leasing activity on Government properties over the next few years.

This brings us to the third point raised in your invitation to us to appear here today—the potential effects of the administration's energy tax proposals on oil company profitability and, more specifically, on oil company ability to find new oil and gas reserves.

In 1977, the most recent year for which we have Department of Commerce data and one of the most active drilling years in recent U.S. history, 1.09 billion barrels of crude oil were added to total U.S. proved reserves. In addition, 11.9 trillion cubic feet were added to proved gas reserves having an oil equivalent value of 1.98 billion barrels. Thus, total additions to proved reserves—which represent reserves both found and developed—of crude oil and crude oil equivalents in 1977 totalled 3.07 billion barrels. This compares with average gross additions of 2.70 billion barrels of oil and oil equivalents from 1976 to 1978.

A precise estimate of the sole cost of finding new oil and gas reserves in the United States is complicated by the highly uncertain lag between the time the expenditure is made and a barrel is bound and by the specific characteristics of the oil field. Consequently, several studies which we have reviewed provide a broad range of average finding costs per barrel for the period 1973-78 which varies from \$2 to \$9 depending upon location and producer. For purposes of this discussion, we have attempted to come up with a rule of thumb finding cost based on the following simplifying assumptions and data approximations:

1. Assume that additions to proved reserves as reported in "20th Century Petroleum Statistics" published by DeGolyer and MacNaughton and based on U.S. Department of Energy, Joint Association

Survey, American Petroleum Institute and American Gas Association sources and adjusted for development data are a usable proxy for new reserves found.

2. Assume that exploration expenditures as reported in the Department of Commerce "Annual Survey of Oil & Gas" are a proxy for finding costs.

3. Assume that the exploration costs incurred and the new proved reserves reported in 1977 are directly related.

On this basis, and by correcting for inflation, we have derived an expected, near term proxy for the cost of finding new oil and oil equivalent reserves without regard to specific field risks, in the United States of approximately \$3.75 to \$5 per barrel.

Accepting this rule of thumb, we trust that it is not necessary to emphasize that the difference between this estimated finding cost and the current market price for oil is not profit to the oil finder nor is it the true replacement value for crude. The market price for a barrel of crude oil or crude oil equivalents must cover, in addition to the sole cost of finding that oil, operating expenses over the economic life required to bring those reserves to the surface, transform them into products required by the market, transport them to the market and sell them.

The market price must also cover all taxes borne by the seller whether excise taxes, such as those proposed in the administration's new proposals, or income taxes. Finally, the market price must also include an allowance for both the return on and the return of capital to the producers, lenders and shareholders.

Given the current return required by investors in industrial assets today, the total market price required to cover all of these costs is greater than \$16 per barrel.

We then attempted to estimate of the impact of the proposed "windfall profits" tax on the revenues to be received by the producers of crude oil in the United States as the result of removal of present price controls.

As stated in the analysis of H.R. 3919 prepared by the staff of the Joint Committee on Taxation, "The administration estimates that the net revenue from its proposed windfall profits tax, allowing for its being deductible under the income tax, would be \$0.5 billion in calendar year 1980, \$1.5 billion in 1981 and \$1.7 billion in 1982," or a total of \$3.7 billion in crude oil producer after tax revenues as a result of the tax in the 1979-81 period.

Based upon the above-calculated benchmark finding cost per barrel, this diversion of funds is equivalent to foregoing an increase in domestic crude oil and crude oil equivalent reserves of 750 million to 1 billion barrels. Alternatively, if the United States were obliged to import this amount of crude oil from foreign producers rather than generate it from domestic reserves, it would amount to an additional balance-of-payments outflow of \$12 to \$16 billion.

We stress that this estimate is only for the first 3 years of the administration's tax proposal. As revenues rise thereafter, the diversion of funds which would normally be available for new exploration programs would presumably have an even greater negating effect on our domestic reserve position. The longer term impact of the tax will be determined by the problematical rate at which OPEC raises prices, by the future course of the GNP deflator and by the pricing

points set in the administration's or Congress present and future tax measures. While the net dollar impact of these uncertain variables cannot today be quantified, one thing is certain: the permanent tax being proposed on new oil discoveries is a disincentive to exploration. Ideally, to realize our national energy goal of reducing dependence on foreign supply, the faster the foreign oil producers raise their prices the harder U.S. oil companies should be looking for U.S. domestic reserves. This is how decontrol should lead to realization of national goals of energy self-sufficiency. Instead, the windfall tax proposal would effectively divert the flow of world market price revenues away from oil producers and, consequently, away from exploration programs and would make the U.S. Government the cobeneficiary of future OPEC price rises without any assurance to U.S. citizens of concomitant energy benefits. As such, the so-called windfall profits tax represents a further, indirect encouragement to the continuation of our growing dependence on foreign oil supplies. To precondition events by imposing specialized excise taxes which will inevitably reduce exploration programs, strikes us as a flagrant example of objectives in conflict.

Three Presidents have held office since the 1973-74 OPEC embargo and still the United States is searching for an energy policy. The conflict of Government objectives between increasing tax revenues and increasing energy independence only worsens. The current debate about a so-called "windfall profits" tax epitomizes this conflict. The present, incredible maze of energy product pricing regulations began with an apparent laudable objective: to maximize energy supplies while minimizing economic hardship for Americans. Now, as we head into what may be another period of foreign producer price increases, the proposed measures, effectively turn the Government's initial, laudable objective on its head and instead offer American crude oil producers minimum incentive to discover new, domestic energy supplies while promising increased energy product tax costs at the consumer level.

The fact of the matter is that rising energy costs are dictated by our dependence on foreign supplies and that the principal foreign suppliers, acting as a unit, can force us to meet their price so long as we do not take meaningful action to develop our domestic supplies.

The conflict in objectives between energy independence and the reduction of oil company profitability has further consequences for Americans: U.S. oil company revenues flow to U.S. suppliers, to U.S. citizens who are employees of these companies, to the Internal Revenue Service, and to millions of U.S. shareholders. Revenues which we export leave our economy forever unless the producer countries decide to reinvest or spend them here.

The purpose of our testimony today has been to reconfirm the well-established fact that the oil industry cash flow is reinvested in oil industry investments and that the industry is successful in finding new, domestic proved reserves. The current price for such finding is going up quickly under the forces of inflation, regulation and the need to drill in more remote and more difficult fields.

To the extent that revenues are diverted from oil company exploration programs by virtue of new layers of taxation, it seems to us that Government assumes the responsibility to the citizens of the United States that it will invest these additional tax revenues in new energy

sources more efficiently and were quickly than the oil industry would. Based upon the recent record of various governmental forays into attractive-sounding new energy technologies, we respectfully suggest that this critical "tradeoff" proposed by the administration demands the most intense scrutiny by the Congress.

Thank you, Mr. Chairman, and members of the subcommittee, for your attention.

Senator GRAVEL. Thank you very much for a very fine statement by yourself and your colleague.

[The attachment to Mr. Copp's statement follows:]

#### CONSOLIDATED FIRMS

[Companies included in consolidation are: Amerada Hess, Belco Petroleum, Kerr McGee, Reserve Oil & Gas, Standard of California, Pennzoil, Gulf Oil, Occidental Oil, Panhandle Eastern, El Paso, Louisiana Land, Cities Service, Marathon Oil, Shell Oil, Sun Co., Mobil Oil, Exxon Corp., Coastal States Gas, Mesa Petroleum, Ashland Oil, Continental Oil, Murphy Oil, Standard (Indiana), Standard (Ohio), Houston Oil & Minerals, Union Oil of California, Texaco Oil, Texas Oil & Gas, General American Oil, Superior Oil, Atlantic Richfield, Getty Oil, Phillips]

	1971	1972	1973	1974	1975	1976	1977	1978
<b>Industry aggregate:</b>								
Retained cash flow.....	\$9,093.1	\$9,908.8	\$14,048.5	\$19,530.8	\$14,688.6	\$18,316.5	\$20,293.2	\$23,899.6
Capital expenditures.....	10,175.3	10,752.4	12,639.5	19,606.1	21,196.6	22,451.4	24,045.5	25,653.6
Retained cash flow/capital expenditures (percent)....	(89.4)	(92.2)	(111.1)	(99.6)	(69.3)	(81.6)	(84.4)	(93.2)
Issuance of long-term debt.....	3,981.3	2,914.2	3,104.7	4,473.7	7,841.4	8,432.5	6,905.5	4,360.2
Equity issuance.....	197.4	240.2	334.1	335.2	551.5	830.9	1,360.7	467.1
Common dividends.....	3,134.0	3,132.1	3,295.9	3,849.6	4,156.5	4,406.8	5,064.3	5,619.6
Preferred dividends.....	190.9	181.0	184.0	165.3	171.4	165.7	149.7	124.5
Cash dividends.....	3,325.0	3,313.2	3,479.9	4,014.9	4,328.4	4,570.0	5,212.1	5,744.1
<b>Capitalization:</b>								
Total long-term debt.....	19,834.9	20,298.5	21,264.6	23,578.8	27,691.8	33,361.5	37,761.9	41,343.4
Preferred stock (carrying value).....	468.9	464.6	419.9	326.4	313.2	249.4	267.6	NA
Total common equity.....	58,515.9	61,468.0	67,637.1	77,249.7	81,301.8	89,503.2	98,268.7	104,458.4
Total capitalization.....	80,241.3	83,738.5	90,979.7	103,279.3	111,582.7	125,549.9	138,705.6	149,163.1
<b>Items as a percentage of capitalization:</b>								
Total long-term debt.....	24.7	24.2	23.4	22.8	24.8	26.6	27.2	28.0
Preferred stock.....	.6	.6	.5	.3	.3	.2	.2	NA
Total common equity.....	72.9	73.4	74.3	74.8	72.9	71.3	70.8	70.8
<b>Income statement data:</b>								
Net income.....	6,218.1	6,272.0	9,639.7	13,535.8	10,206.3	11,987.0	12,621.0	13,720.3
Common dividends.....	3,134.0	3,132.1	3,295.9	3,849.6	4,156.5	4,406.8	5,064.3	5,620.2
Payout ratio.....	(46.7)	(44.8)	(29.1)	(22.2)	(31.1)	(28.3)	(30.6)	(35.2)
Dividends per share.....	42.7	42.0	40.1	44.4	49.3	48.5	54.0	55.4
Earnings per share.....	91.4	93.8	137.9	200.2	158.3	171.3	176.5	157.5

#### INTERNATIONAL CONSOLIDATED FIRMS

[The following firms are included in the consolidation: Standard of California, Mobil Oil, Texaco, Exxon Corp., Occidental Petroleum, Gulf Oil]

	1971	1972	1973	1974	1975	1976	1977	1978
<b>Industry aggregate:</b>								
Retained cash flow.....	\$4,835.2	\$5,197.0	\$8,164.7	\$10,721.7	\$6,151.4	\$8,234.0	\$8,766.2	\$10,152.7
Capital expenditures.....	5,616.4	5,582.9	6,317.5	9,186.3	8,604.6	9,333.3	9,701.5	10,815.4
Retained cash flow/capital expenditures (percent)....	(86.1)	(93.1)	(129.2)	(116.7)	(69.9)	(88.2)	(90.4)	(93.8)
Issuance of long-term debt.....	2,252.4	1,345.7	1,504.0	1,753.5	2,636.6	2,743.1	1,757.8	1,016.1
Equity issuance.....	42.5	8.6	5.2	18.3	108.3	284.0	225.2	75.3
Common dividends.....	2,142.9	2,129.6	2,266.9	2,662.8	2,733.6	2,884.0	3,137.1	3,363.4
Preferred dividends.....	20.3	19.2	19.3	19.3	24.5	26.5	27.6	32.4
Cash dividends.....	2,163.2	2,148.8	2,286.3	2,682.2	2,757.3	2,909.5	3,163.5	3,395.9
<b>Capitalization:</b>								
Total long-term debt.....	9,156.2	9,028.8	9,171.5	10,204.3	11,014.2	12,827.9	13,132.0	15,503.8
Preferred stock (carrying value).....	5.2	5.2	5.2	5.2	7.9	7.7	10.5	NA
Total common equity.....	34,444.5	36,044.8	39,686.0	45,031.6	46,676.0	50,370.8	53,765.2	55,356.9
Total capitalization.....	44,460.2	45,995.7	49,869.6	56,419.1	58,977.7	64,680.4	68,479.4	72,982.6

## INTERNATIONAL CONSOLIDATED FIRMS—Continued

[The following firms are included in the consolidation: Standard of California, Mobil Oil, Texaco, Exxon Corp., Occidental Petroleum, Gulf Oil]

	1971	1972	1973	1974	1975	1976	1977	1978
<b>Items as a percent of capitalization:</b>								
Total long-term debt.....	20.6	19.6	18.4	18.1	18.7	19.8	19.2	21.7
Preferred stock.....	0	0	0	0	0	0	0	NA
Total common equity.....	77.5	78.4	79.6	79.8	79.1	77.9	78.5	77.6
<b>Income statement data:</b>								
Net income.....	3,985.7	4,008.8	6,308.3	8,133.8	5,790.6	6,334.7	6,344.7	6,644.7
Common dividends.....	2,142.3	2,129.6	2,266.9	2,662.8	2,733.6	2,884.0	3,137.1	3,344.1
Payout ratio.....	(57.4)	(51.4)	(34.7)	(30.0)	(45.7)	(43.2)	(46.0)	(51.0)
<b>TEXACO, INC</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	855.7	867.1	1,455.9	2,064.4	338.8	977.6	1,238.6	1,558.9
Capital expenditures.....	1,047.2	1,112.6	1,240.7	1,859.2	1,387.3	1,239.4	1,247.8	1,344.4
Retained cash flow/capital expenditures (percent).....	(81.7)	(77.9)	(117.3)	(111.0)	(24.4)	(78.9)	(99.3)	(116.0)
Issuance of long-term debt.....	334.7	123.9	470.7	194.3	305.8	440.8	50.9	64.4
Equity issuance.....	0	0	0	0	0	0	0	0
Common dividends.....	435.7	451.6	470.4	570.6	543.0	542.9	542.9	542.9
Preferred dividends.....	0	0	0	0	0	0	0	0
Cash dividends.....	435.7	451.6	470.4	570.6	543.0	542.9	542.9	542.9
<b>Capitalization:</b>								
Total long-term debt.....	1,289.6	1,359.7	1,777.9	1,897.0	2,234.2	2,585.5	2,558.8	3,639.5
Preferred stock (carrying value).....	0	0	0	0	0	0	0	0
Total common equity.....	6,745.0	7,174.9	7,992.3	9,002.8	8,674.8	9,002.1	9,390.7	9,462.5
Total capitalization.....	8,117.0	8,627.0	9,874.3	11,017.2	11,031.7	11,716.1	12,086.9	13,194.7
<b>Items as a percentage of capitalization:</b>								
Total long-term debt.....	15.9	15.8	18.0	17.2	20.3	22.1	21.2	27.6
Preferred stock.....	0	0	0	0	0	0	0	0
Total common equity.....	83.1	83.2	80.9	81.7	78.6	76.8	77.7	71.7
<b>Income statement data:</b>								
Net income.....	903.9	889.0	1,292.4	1,586.4	830.6	869.7	930.8	852.5
Common dividends.....	435.7	451.6	470.4	570.6	543.0	542.9	542.9	542.9
Payout ratio.....	(48.2)	(50.8)	(36.4)	(36.0)	(65.4)	(52.6)	(58.3)	(63.7)
<b>EXXON CORP.</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	1,836.1	2,000.5	3,127.0	3,990.5	2,456.2	3,459.1	3,154.4	3,818.9
Capital expenditures.....	1,810.8	1,984.0	2,234.9	2,910.1	3,558.4	4,098.4	3,596.3	4,186.9
Retained cash flow/capital expenditures (percent).....	(101.4)	(100.8)	(139.9)	(137.1)	(69.0)	(84.4)	(87.7)	(91.2)
Issuance of long-term debt.....	547.8	546.7	624.5	619.8	815.3	833.0	620.0	330.0
Equity issuance.....	32.2	NA	NA	NA	5.9	25.1	0	0
Common dividends.....	851.5	851.9	952.5	1,118.9	1,118.3	1,220.1	1,343.9	1,472.2
Preferred dividends.....	0	0	0	0	0	0	0	0
Cash dividends.....	851.5	851.9	952.5	1,118.9	1,118.3	1,220.1	1,343.9	1,472.2
<b>Capitalization:</b>								
Total long-term debt.....	2,679.2	2,616.9	2,670.9	3,051.7	3,451.1	3,696.8	3,870.0	3,749.2
Preferred stock (carrying value).....	0	0	0	0	0	0	0	0
Total common equity.....	11,592.9	12,269.5	13,717.7	15,724.0	17,024.4	18,470.4	19,512.9	20,228.6
Total capitalization.....	14,766.3	15,422.8	16,979.7	19,460.3	21,185.8	22,941.7	24,208.2	24,858.2
<b>Items as a percent of capitalization:</b>								
Total long-term debt.....	18.1	17.0	15.7	15.7	16.3	16.1	16.0	15.1
Preferred stock.....	0	0	0	0	0	0	0	0
Total common equity.....	78.5	79.6	80.8	80.8	80.4	80.5	80.6	81.4
<b>Income statement data:</b>								
Net income.....	1,516.6	1,531.8	2,443.3	3,142.2	2,503.0	2,641.0	2,423.0	2,763.0
Common dividends.....	851.5	851.9	952.5	1,118.9	1,118.3	1,220.1	1,343.9	1,472.2
Payout ratio.....	(56.1)	(55.6)	(39.0)	(35.6)	(44.7)	(46.2)	(55.5)	(53.2)
<b>MOBIL CORP.</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	653.9	771.8	1,078.1	1,606.6	790.9	1,218.9	1,443.6	1,642.1
Capital expenditures.....	911.0	1,030.0	1,185.8	1,449.7	1,206.2	1,286.2	1,285.2	1,760.7
Retained cash flow/capital expenditures (percent).....	(71.8)	(74.9)	(90.9)	(110.8)	(65.6)	(94.8)	(112.3)	(93.3)
Issuance of long-term debt.....	280.9	334.7	92.7	733.6	710.6	864.5	634.2	203.5
Equity issuance.....	9.8	8.6	5.2	1	3	231.9	5.8	3.8
Common dividends.....	258.8	269.3	285.1	325.9	346.3	363.6	413.0	455.6
Preferred dividends.....	0	0	0	0	0	0	0	0
Cash dividends.....	258.8	269.3	285.1	325.9	346.3	363.6	413.0	455.6

## INTERNATIONAL CONSOLIDATED FIRMS—Continued

[The following firms are included in the consolidation: Standard of California, Mobil Oil, Texaco, Exxon Corp., Occidental Petroleum, Gulf Oil]

	1971	1972	1973	1974	1975	1976	1977	1978
<b>Capitalization:</b>								
Total long-term debt.....	1,134.3	1,083.4	1,087.3	1,729.2	1,834.4	2,881.8	3,076.9	3,409.3
Preferred stock (carrying value).....	0	0	0	0	0	0	0	0
Total common equity.....	4,831.9	5,145.4	5,714.8	6,436.4	6,841.0	7,651.8	8,249.3	8,910.3
Total capitalization.....	5,968.0	6,251.0	6,826.9	8,190.0	8,698.9	10,582.3	11,375.2	12,376.4
<b>Items as a percent of capitalization:</b>								
Total long-term debt.....	18.9	17.3	15.9	21.1	21.1	27.2	27.0	27.5
Preferred stock.....	0	0	0	0	0	0	0	0
Total common equity.....	80.7	82.3	83.7	78.6	78.6	72.3	72.5	72.0
<b>Income statement data:</b>								
Net income.....	540.8	574.2	849.3	1,047.4	809.9	942.5	1,004.7	1,125.6
Common dividends.....	258.8	269.3	285.1	325.9	346.3	363.6	413.0	455.6
Payout ratio.....	(47.8)	(46.9)	(33.6)	(31.1)	(42.8)	(38.5)	(41.1)	(40.5)
<b>OCCIDENTAL PETROLEUM CORP.</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	72.5	100.4	220.8	416.3	339.2	282.8	507.3	321.7
Capital expenditures.....	216.9	181.5	199.4	424.0	495.7	553.6	627.2	794.4
Retained cash flow/capital expenditures (percent).....	(33.4)	(55.3)	(110.7)	(98.2)	(68.4)	(51.1)	(80.9)	(40.5)
Issuance of long-term debt.....	206.6	182.7	173.8	204.2	247.8	141.9	155.0	390.4
Equity issuance.....	5	0	0	18.2	102.1	27.0	219.4	71.5
Common dividends.....	47.5	0	0	13.8	55.7	56.4	77.3	87.1
Preferred dividends.....	20.3	19.2	19.3	19.3	24.5	26.5	27.6	32.4
Cash dividends.....	67.8	19.2	19.3	33.1	79.4	81.9	103.7	119.4
<b>Capitalization:</b>								
Total long-term debt.....	898.7	995.8	963.8	1,040.3	853.3	924.8	751.6	1,063.5
Preferred stock (carrying value).....	5.2	5.2	5.2	5.2	7.9	7.7	10.5	498.9
Total common equity.....	834.1	825.4	885.8	1,089.2	1,192.7	1,297.5	1,637.1	1,767.9
Total capitalization.....	1,755.0	1,845.2	1,875.7	2,172.3	2,124.2	2,355.3	2,528.2	2,458.5
<b>Items as a percent capitalization:</b>								
Total long-term debt.....	51.2	54.0	51.4	47.9	40.2	39.3	29.7	43.3
Preferred stock.....	3	3	3	2	4	3	4	20.3
Total common equity.....	47.5	44.7	47.2	50.1	56.1	55.1	64.8	31.2
<b>Income statement data:</b>								
Net income.....	(48.0)	19.7	79.8	322.7	174.6	185.4	217.9	6.7
Common dividends.....	47.5	0	0	13.8	55.7	56.4	77.3	87.1
Payout ratio.....	(69.4)	(0)	(0)	(4.5)	(37.2)	(35.7)	(40.7)	NA
<b>GULF OIL CORP.</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	799.0	779.0	1,264.0	1,490.0	1,208.0	1,226.0	1,225.0	1,476.0
Capital expenditures.....	908.0	678.0	784.0	1,399.0	1,131.0	1,362.0	2,054.0	1,680.0
Retained cash flow/capital expenditures (percent).....	(88.0)	(114.9)	(161.2)	(106.5)	(106.8)	(90.0)	(59.6)	(87.9)
Issuance of long-term debt.....	504.0	129.0	60.0	NA	156.0	156.0	200.0	NA
Equity issuance.....	0	0	0	0	0	0	0	0
Common dividends.....	312.0	311.0	296.0	307.0	331.0	336.0	360.0	371.0
Preferred dividends.....	0	0	0	0	0	0	0	0
Cash dividends.....	312.0	311.0	296.0	307.0	331.0	336.0	360.0	371.0
<b>Capitalization:</b>								
Total long-term debt.....	2,100.0	1,941.0	1,608.0	1,471.0	1,294.0	1,168.0	1,307.0	1,489.0
Preferred stock (carrying value).....	0	0	0	0	0	0	0	0
Total common equity.....	5,521.0	5,409.0	5,569.0	6,329.0	6,458.0	6,942.0	7,337.0	7,757.0
Total capitalization.....	7,860.0	7,597.0	7,443.0	8,114.0	8,105.0	8,507.0	9,075.0	9,711.0
<b>Items as a percentage of capitalization:</b>								
Total long-term debt.....	26.7	25.5	21.6	18.1	16.0	13.7	14.4	15.3
Preferred stock.....	0	0	0	0	0	0	0	0
Total common equity.....	70.2	71.2	74.8	78.0	79.7	81.6	80.8	79.9
<b>Income statement data:</b>								
Net income.....	561.4	447.0	800.0	1,065.0	700.0	816.0	752.0	791.0
Common dividends.....	312.0	311.0	296.0	307.0	331.0	336.0	360.0	371.0
Payout ratio.....	(55.6)	(69.8)	(36.9)	(28.8)	(47.2)	(41.2)	(47.9)	(46.8)

## INTERNATIONAL CONSOLIDATED FIRMS—Continued

[The following firms are included in the consolidation: Standard of California, Mobil Oil, Texaco, Exxon Corp., Occidental Petroleum, Gulf Oil—Continued]

	1971	1972	1973	1974	1975	1976	1977	1978
<b>STANDARD OIL CO. (CALIFORNIA)</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	617.9	678.2	1,018.9	1,153.8	1,018.3	1,069.6	1,197.3	1,335.1
Capital expenditures.....	722.4	596.9	672.7	1,144.3	1,025.9	793.7	890.9	1,049.7
Retained cash flow/capital expenditures (percent).....	(85.5)	(113.6)	(151.5)	(100.8)	(99.3)	(134.8)	(134.4)	(127.2)
Issuance of long-term debt.....	378.4	28.7	82.3	1.6	401.1	306.9	97.7	27.7
Equity issuance.....	0	0	0	0	0	0	0	0
Common dividends.....	237.4	245.8	263.0	326.6	339.3	365.0	400.0	434.6
Preferred dividends.....	0	0	0	0	0	0	0	0
Cash dividends.....	237.4	245.8	263.0	326.6	339.3	365.0	400.0	434.6
<b>Capitalization:</b>								
Total long-term debt.....	1,054.4	1,032.0	1,063.7	1,015.1	1,347.1	1,571.0	1,567.7	2,153.3
Preferred stock (carrying value).....	0	0	0	0	0	0	0	0
Total common equity.....	4,919.5	5,220.7	5,806.4	6,450.2	6,485.1	7,007.0	7,638.2	8,230.6
Total capitalization.....	5,973.9	6,252.7	6,870.1	7,465.3	7,832.2	8,578.0	9,205.9	10,383.8
<b>Items as a percent of capitalization:</b>								
Total long-term debt.....	17.7	16.5	15.5	13.6	17.2	18.3	17.0	20.7
Preferred stock.....	0	0	0	0	0	0	0	0
Total common equity.....	82.3	83.5	84.5	86.4	82.8	81.7	83.0	79.3
<b>Income statement data:</b>								
Net income.....	511.1	547.1	843.6	970.0	772.5	880.1	1,016.4	1,105.9
Common dividends.....	237.4	245.8	263.0	326.6	339.3	365.0	400.0	434.6
Payout ratio.....	(46.5)	(45.0)	(31.2)	(33.7)	(44.0)	(41.5)	(39.4)	(39.4)

## INTEGRATED DOMESTIC CONSOLIDATED FIRMS

[Companies included in consolidation are: Amerada Hess, Belco Petroleum, Kerr McGee, Coastal States, Cities Service, Marathon Oil, Shell Oil, Sun Co., Atlantic Richfield, Getty Oil, Ashland Oil, Continental Oil, Murphy Oil, Standard (Indiana), Union Oil of California, Phillips, Standard (Ohio), El Paso]

<b>Industry aggregate:</b>								
Retained cash flow.....	\$3,932.9	\$4,306.9	\$5,391.1	\$8,091.7	\$7,802.2	\$9,111.4	\$10,443.7	\$12,392.3
Capital expenditures.....	4,236.4	4,652.5	5,506.8	9,481.4	11,485.2	12,152.2	12,957.4	12,954.5
Retained cash flow/capital expenditures (percent).....	(92.8)	(92.6)	(97.9)	(85.3)	(67.9)	(75.0)	(80.6)	(95.7)
Issuance of long-term debt.....	1,337.0	1,026.0	1,294.8	2,241.4	4,400.9	4,955.6	4,502.6	2,200.9
Equity issuance.....	121.6	213.0	175.2	315.6	367.9	444.5	1,053.6	283.8
Common dividends.....	903.3	912.8	935.2	1,072.2	1,287.3	1,395.2	1,739.1	2,041.8
Preferred dividends.....	154.5	147.4	147.9	136.5	134.8	126.0	111.3	79.0
Cash dividends.....	1,057.9	1,069.1	1,083.1	1,208.7	1,422.0	1,511.2	1,850.4	2,120.8
<b>Capitalization:</b>								
Total long-term debt.....	9,247.6	9,587.6	10,240.7	11,259.1	14,332.1	18,104.3	21,901.1	22,743.9
Preferred stock (carrying value).....	409.5	406.6	362.9	276.7	259.0	201.0	223.0	284.5
Total common equity.....	22,447.7	23,602.6	25,717.5	29,781.8	31,855.1	35,846.1	40,678.5	44,976.0
Total capitalization.....	32,579.6	34,063.1	36,839.6	42,049.4	47,185.3	54,944.1	63,416.0	68,721.6
<b>Items as a percentage of capitalization:</b>								
Total long-term debt.....	28.4	28.1	27.8	26.8	30.4	33.0	34.5	33.1
Preferred stock.....	1.3	1.2	1.0	.7	.5	.4	.4	.4
Total common equity.....	68.9	69.3	69.8	70.8	67.5	65.2	64.1	65.5
<b>Income statement data:</b>								
Net income.....	2,043.7	2,031.5	3,019.9	4,938.9	3,980.2	5,113.5	5,674.8	6,473.6
Common dividends.....	903.3	912.8	935.2	1,072.2	1,287.3	1,385.2	1,739.1	2,041.8
Payout ratio.....	(43.9)	(45.1)	(27.9)	(20.4)	(29.4)	(25.9)	(28.9)	(30.8)
Dividends per share.....	23.8	23.8	22.5	23.7	26.8	27.1	30.1	29.4
Earnings per share.....	54.3	52.7	80.5	116.3	91.1	104.6	104.2	95.2

## PHILLIPS PETROLEUM CO.

<b>Industry aggregate:</b>								
Retained cash flow.....	235.9	269.8	371.1	648.4	602.1	681.0	831.9	936.0
Capital expenditures.....	225.0	264.7	329.0	618.0	693.9	727.8	1,091.4	956.2
Retained cash flow/capital expenditures (percent).....	(104.9)	(101.9)	(112.8)	(104.9)	(86.8)	(93.6)	(76.2)	(97.9)
Issuance of long-term debt.....	257.0	49.7	80.7	76.9	310.6	55.1	75.4	3.4
Equity issuance.....	20.8	19.8	11.5	18.0	7.7	18.1	17.2	23.5
Common dividends.....	96.8	97.6	98.2	110.0	121.8	133.7	149.5	184.8
Preferred dividends.....	0	0	0	0	0	0	0	0
Cash dividends.....	96.8	97.6	98.2	110.0	121.8	133.7	147.5	183.8

## INTEGRATED DOMESTIC CONSOLIDATED FIRMS—Continued

Companies included in consolidation are: Amerada Hess, Belco Petroleum, Kerr McGee, Coastal States, Cities Service, Marathon Oil, Shell Oil, Sun Co., Atlantic Richfield, Getty Oil, Ashland Oil, Continental Oil, Murphy Oil, Standard (Indiana), Union Oil of California, Phillips, Standard (Ohio), El Paso

	1971	1972	1973	1974	1975	1976	1977	1978
<b>Capitalization:</b>								
Total long-term debt.....	800.2	791.8	799.1	658.2	892.7	839.0	923.0	796.5
Preferred stock (carrying value).....	0	0	0	0	0	0	0	0
Total common equity.....	1,749.2	1,819.8	1,963.6	2,273.7	2,424.3	2,720.3	3,086.8	3,635.9
Total capitalization.....	2,555.9	2,616.4	2,768.2	2,939.9	3,329.0	3,569.9	4,020.1	4,442.8
<b>Items as a percent of capitalization:</b>								
Total long-term debt.....	31.3	30.3	28.9	22.4	26.8	23.5	23.0	17.9
Preferred stock.....	0	0	0	0	0	0	0	0
Total common equity.....	68.4	69.6	70.9	77.3	72.8	76.2	76.8	81.8
<b>Income statement data:</b>								
Net income.....	132.3	148.4	230.4	429.8	342.6	411.7	516.9	710.5
Common dividends.....	96.8	97.6	98.2	110.0	121.8	133.7	149.5	184.8
Payout ratio.....	(73.0)	(65.7)	(42.6)	(25.6)	(35.6)	(32.5)	(28.9)	(26.0)
<b>GETTY OIL CO.</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	302.5	279.8	230.0	537.2	581.7	565.8	720.1	840.1
Capital expenditures.....	214.6	273.0	437.0	450.5	519.6	624.5	691.9	874.7
Retained cash flow/capital expenditures.....	(141.0)	(102.5)	(52.6)	(119.2)	(112.0)	(90.6)	(104.1)	(96.0)
Issuance of long-term debt.....	.8	16.7	59.2	9.7	65.9	23.6	23.8	5.4
Equity issuance.....	0	0	0	0	0	0	336.3	0
Common dividends.....	21.5	21.9	22.6	24.3	46.6	46.6	78.0	88.3
Preferred dividends.....	1.9	1.8	1.6	1.4	1.3	1.2	1.2	1.1
Cash dividends.....	23.4	23.7	24.1	25.7	47.9	47.8	79.3	89.5
<b>Capitalization:</b>								
Total long-term debt.....	105.3	112.9	178.9	157.7	179.1	186.3	191.5	170.4
Preferred stock (carrying value).....	38.6	35.5	30.6	28.4	26.5	25.8	24.7	23.1
Total common equity.....	1,382.5	1,437.0	1,562.1	1,812.6	1,875.7	2,131.4	2,697.9	2,936.6
Total capitalization.....	1,727.0	1,784.5	1,966.0	2,206.5	2,280.5	2,568.5	2,914.1	3,130.0
<b>Items as a percent of capitalization:</b>								
Total long-term debt.....	6.1	6.3	9.1	7.1	7.9	7.3	6.6	5.4
Preferred stock.....	2.2	2.0	1.6	1.3	1.2	1.0	.8	.7
Total common equity.....	80.1	80.5	79.5	82.1	82.3	83.0	92.6	93.8
<b>Income statement data:</b>								
Net income.....	120.1	76.1	135.0	281.0	256.7	258.5	327.8	327.8
Common dividends.....	21.5	21.9	22.6	24.3	46.6	46.6	78.0	88.3
Payout ratio.....	(18.1)	(29.4)	(16.9)	(8.7)	(18.2)	(18.1)	(23.7)	(27.0)
<b>ATLANTIC RICHFIELD CO.</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	347.2	510.8	440.9	808.9	768.6	1,029.1	1,199.6	1,643.2
Capital expenditures.....	543.9	363.5	499.6	1,162.7	1,750.6	1,826.5	1,681.3	1,358.2
Retained cash flow/capital expenditures.....	(63.8)	(140.5)	(88.3)	(69.6)	(43.9)	(56.3)	(71.4)	(121.0)
Issuance of long-term debt.....	35.0	0	281.3	274.7	523.7	569.8	427.4	42.4
Equity issuance.....	13.9	6.9	11.2	6.1	15.2	26.8	384.3	NA
Common dividends.....	90.9	91.9	92.8	105.4	118.1	136.1	187.3	262.2
Preferred dividends.....	40.2	39.9	39.5	39.1	38.7	38.3	37.8	26.3
Cash dividends.....	131.2	131.9	132.3	144.5	156.8	174.4	225.1	288.5
<b>Capitalization:</b>								
Total long-term debt.....	856.0	809.5	987.0	1,219.3	1,602.8	2,162.1	2,811.8	3,300.4
Preferred stock (carrying value).....	48.9	48.8	48.7	48.5	48.4	48.2	48.1	42.6
Total common equity.....	2,848.3	2,919.1	3,069.0	3,406.2	3,615.2	4,042.9	4,903.7	5,464.9
Total capitalization.....	3,753.2	3,777.4	4,104.6	4,742.5	5,314.0	6,253.2	7,763.6	8,807.8
<b>Items as a percentage of capitalization:</b>								
Total long-term debt.....	22.8	21.4	24.0	25.7	30.2	34.6	36.2	37.5
Preferred stock.....	1.3	1.3	1.2	1.0	.9	.8	.6	.5
Total common equity.....	75.9	77.3	74.8	71.8	68.0	64.7	63.2	62.0
<b>Income statement data:</b>								
Net income.....	210.5	192.5	270.2	474.6	350.4	575.2	701.5	804.3
Common dividends.....	90.9	91.9	92.8	105.4	118.1	136.1	187.3	262.2
Payout ratio.....	(53.6)	(58.8)	(42.0)	(26.9)	(40.6)	(28.3)	(31.3)	(36.4)



## INTEGRATED DOMESTIC CONSOLIDATED FIRMS—Continued

[Companies included in consolidation are: Amerada Hess, Belco Petroleum, Kerr McGee, Coastal States, Cities Service, Marathon Oil, Shell Oil, Sun Co., Atlantic Richfield, Getty Oil, Ashland Oil, Continental Oil, Murphy Oil, Standard (Indiana), Union Oil of California, Phillips, Standard (Ohio), El Paso]

	1971	1972	1973	1974	1975	1976	1977	1978
<b>UNION OIL CO. OF CALIFORNIA</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	313.7	336.6	408.4	643.5	575.4	671.6	793.2	827.0
Capital expenditures.....	283.8	314.4	390.8	688.1	686.4	813.7	812.9	732.0
Retained cash flow/capital expenditures (percent)....	(110.5)	(107.1)	(104.5)	(93.5)	(83.8)	(82.5)	(97.6)	(113.0)
Issuance of long-term debt.....	28.9	70.3	28.2	170.1	207.2	271.6	114.6	69.5
Equity issuance.....	0	0	0	0	0	0	0	0
Common dividends.....	45.4	45.4	47.0	60.3	63.1	75.1	91.4	102.8
Preferred dividends.....	24.1	24.1	23.9	20.1	17.5	10.0	6.0	0
Cash dividends.....	69.5	69.5	70.9	80.4	80.6	85.1	97.5	102.8
<b>Capitalization:</b>								
Total long-term debt.....	546.0	578.3	564.2	648.0	732.4	925.8	1,024.5	1,250.1
Preferred stock (carrying value).....	104.3	104.3	102.3	84.6	71.9	33.3	24.0	0
Total common equity.....	1,448.2	1,500.7	1,612.3	1,838.1	1,847.6	2,070.5	2,413.4	2,654.6
Total capitalization.....	2,115.5	2,201.7	2,299.3	2,593.0	2,673.1	3,044.8	3,478.8	3,922.0
<b>Items as a percent of capitalization:</b>								
Total long-term debt.....	25.8	26.3	24.5	25.0	27.4	30.4	29.5	31.9
Preferred stock.....	4.9	4.7	4.5	3.3	2.7	1.1	.7	0
Total common equity.....	68.5	68.2	70.1	70.9	69.1	68.0	69.4	67.7
<b>Income statement data:</b>								
Net income.....	114.7	121.9	180.2	288.0	232.8	268.8	334.2	382.3
Common dividends.....	45.4	45.4	47.0	60.3	63.1	75.1	91.4	102.8
Payout ratio.....	(50.0)	(46.4)	(29.5)	(21.4)	(29.1)	(27.9)	(27.7)	(26.3)
<b>STANDARD OIL CO. (OHIO)</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	108.9	119.5	152.9	192.6	192.4	215.7	354.0	949.7
Capital expenditures.....	174.6	124.4	219.2	700.4	1,641.6	1,698.8	1,087.1	762.3
Retained cash flow/capital expenditures (percent)....	(62.4)	(96.1)	(69.8)	(27.5)	(11.7)	(12.7)	(32.6)	(124.6)
Issuance of long-term debt.....	12.5	1.4	35.7	395.2	1,154.5	1,696.6	1,077.8	289.7
Equity issuance.....	4.3	2.0	5.2	2.0	141.4	3.9	0	0
Common dividends.....	36.3	36.4	36.7	37.1	50.0	52.4	54.2	90.2
Preferred dividends.....	6	5	5	4	4	4	4	4
Cash dividends.....	36.8	36.9	37.2	37.5	50.5	52.8	54.6	90.6
<b>Capitalization:</b>								
Total long-term debt.....	493.8	404.8	413.5	804.9	1,949.2	3,626.8	4,687.6	4,397.6
Preferred stock (carrying value).....	14.4	13.4	12.2	11.2	11.1	10.6	9.6	8.9
Total common equity.....	1,028.1	1,061.7	1,119.8	1,232.4	1,450.2	1,538.8	1,670.1	2,031.7
Total capitalization.....	1,536.3	1,479.9	1,545.5	2,048.5	3,410.5	5,176.1	6,367.3	6,438.2
<b>Items as a percent of capitalization:</b>								
Total long-term debt.....	32.1	27.4	26.8	39.3	57.2	70.1	73.6	68.3
Preferred stock.....	.9	.9	.8	.5	.3	.2	.2	.1
Total common equity.....	66.9	71.7	72.5	60.2	42.5	29.7	26.2	31.6
<b>Income statement data:</b>								
Net income.....	58.8	59.7	74.1	125.9	126.6	136.9	181.1	450.2
Common dividends.....	36.3	36.4	36.7	37.1	50.0	52.4	54.2	90.2
Payout ratio.....	(83.6)	(82.6)	(66.9)	(39.5)	(39.8)	(38.3)	(31.1)	(20.8)
<b>STANDARD OIL CO. (INDIANA)</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	539.5	619.8	790.7	1,325.5	1,188.1	1,355.9	1,586.5	1,807.5
Capital expenditures.....	572.9	749.5	900.8	1,511.3	1,524.9	1,360.7	1,452.0	1,744.0
Retained cash flow/capital expenditures (percent)....	(94.2)	(82.7)	(87.8)	(87.7)	(77.9)	(99.6)	(109.3)	(103.6)
Issuance of long-term debt.....	242.9	100.1	256.0	496.3	374.8	126.8	463.4	124.9
Equity issuance.....	NA	53.5	0	245.8	0	0	0	0
Common dividends.....	158.8	166.8	180.3	233.9	293.8	337.5	381.3	410.0
Preferred dividends.....	0	0	0	0	0	0	0	0
Cash dividends.....	158.8	166.8	180.3	233.9	293.8	337.5	381.3	410.0

## INTEGRATED DOMESTIC CONSOLIDATED FIRMS—Continued

Companies included in consolidation are: Amerada Hess, Belco Petroleum, Kerr McGee, Coastal States, Cities Service, Marathon Oil, Shell Oil, Sun Co., Atlantic Richfield, Catty Oil, Ashland Oil, Continental Oil, Murphy Oil, Standard (Indiana), Union Oil of California, Phillips, Standard (Ohio), El Paso

	1971	1972	1973	1974	1975	1976	1977	1978
<b>Capitalization:</b>								
Total long-term debt.....	1,028.1	1,061.5	1,235.1	1,427.4	1,708.7	1,757.7	2,491.0	2,532.4
Preferred stock (carrying value).....	0	0	0	0	0	0	0	0
Total common equity.....	3,557.3	3,798.9	4,125.3	5,125.1	5,584.9	6,146.7	6,744.1	7,146.3
Total capitalization.....	4,600.5	4,863.4	5,364.1	6,552.5	7,293.6	7,904.4	9,238.6	9,694.9
<b>Items as a percent of capitalization:</b>								
Total long-term debt.....	22.3	21.8	23.0	21.8	23.4	22.2	27.0	26.1
Preferred stock.....	0	0	0	0	0	0	0	0
Total common equity.....	77.3	78.1	76.9	78.2	76.6	77.8	73.0	73.7
<b>Income statement data:</b>								
Net income.....	341.7	374.7	511.2	970.3	787.0	893.0	1,011.6	1,076.4
Common dividends.....	158.8	166.8	180.3	233.9	293.8	337.5	381.3	410.0
Payout ratio.....	(46.5)	(44.5)	(35.3)	(24.1)	(37.3)	(37.8)	(37.7)	(38.0)
<b>MURPHY OIL CORP.</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	44.2	55.0	112.1	142.9	134.6	144.9	133.9	151.5
Capital expenditures.....	57.2	117.4	103.1	141.0	195.1	156.1	244.2	255.6
Retained cash flow/capital expenditures (percent).....	(77.4)	(46.9)	(108.7)	(101.3)	(69.0)	(92.9)	(54.8)	(59.3)
Issuance of long-term debt.....	28.8	67.4	45.6	144.2	59.0	72.5	126.8	166.3
Equity issuance.....	25.7	16.9	3.2	21.5	0	18.7	0	0
Common dividends.....	3.0	3.2	3.7	7.5	7.5	7.5	9.9	9.9
Preferred dividends.....	1.1	1.1	.1	.1	.1	0	0	0
Cash dividends.....	4.1	4.3	3.8	7.6	7.6	7.5	9.9	9.9
<b>Capitalization:</b>								
Total long-term debt.....	102.9	153.6	166.7	263.7	296.2	281.7	354.5	480.9
Preferred stock (carrying value).....	20.2	2.6	2.1	1.6	1.1	0	0	0
Total common equity.....	158.3	185.0	238.1	310.4	338.5	379.5	415.5	452.3
Total capitalization.....	360.2	425.9	500.0	678.7	753.8	815.3	935.1	1,108.8
<b>Items as a percent of capitalization:</b>								
Total long-term debt.....	28.6	36.1	33.3	38.9	39.3	34.6	37.9	43.4
Preferred stock.....	5.6	.6	.4	.2	.1	0	0	0
Total common equity.....	43.9	43.4	47.6	45.7	44.9	46.6	44.4	40.8
<b>Income statement data:</b>								
Net income.....	11.1	14.3	48.5	66.6	40.1	48.9	47.1	46.6
Common dividends.....	3.0	3.2	3.7	7.5	7.5	7.5	9.9	9.9
Payout ratio.....	(29.9)	(24.3)	(7.6)	(11.2)	(18.8)	(15.3)	(21.1)	(21.3)
<b>CONTINENTAL OIL CO.</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	332.6	321.8	476.5	550.9	623.1	730.3	744.9	860.0
Capital expenditures.....	387.5	458.1	372.8	674.3	797.2	775.6	837.2	1,107.4
Retained cash flow/capital expenditures (percent).....	(85.8)	(70.2)	(127.8)	(81.7)	(78.2)	(94.2)	(89.0)	(77.7)
Issuance of long-term debt.....	76.2	65.6	51.7	230.4	105.8	214.1	90.6	310.0
Equity issuance.....	0	0	0	0	0	148.7	0	0
Common dividends.....	74.8	74.9	76.5	85.8	101.6	120.3	144.7	153.0
Preferred dividends.....	1.5	1.4	1.2	.9	.8	.6	.5	.4
Cash dividends.....	76.3	76.4	77.7	86.8	102.4	121.0	145.2	153.4
<b>Capitalization:</b>								
Total long-term debt.....	711.0	702.0	700.2	892.5	904.1	1,041.4	1,349.0	1,488.5
Preferred stock (carrying value).....	2.6	2.5	1.8	1.6	1.4	1.0	.8	0.7
Total common equity.....	1,533.5	1,637.5	1,806.6	2,052.7	2,133.5	2,634.4	2,848.8	3,147.1
Total capitalization.....	2,362.0	2,454.7	2,632.8	3,090.9	3,205.0	3,867.8	4,421.1	4,887.0
<b>Items as a percent of capitalization:</b>								
Total long-term debt.....	30.1	28.6	26.6	28.9	28.2	26.9	30.5	30.5
Preferred stock.....	.1	.1	.1	.1	0	0	0	0
Total common equity.....	64.9	66.7	68.6	66.4	66.6	68.1	64.4	64.4
<b>Income statement data:</b>								
Net income.....	140.1	170.2	242.7	327.6	330.9	460.0	380.8	451.3
Common dividends.....	74.8	74.9	76.5	85.8	101.6	120.3	144.7	153.0
Payout ratio.....	(54.0)	(44.4)	(31.7)	(26.3)	(30.8)	(26.3)	(38.0)	(33.9)

## INTEGRATED DOMESTIC CONSOLIDATED FIRMS—Continued

Companies included in consolidation are: Amara Hess, Belco Petroleum, Kerr McGee, Coastal States, Cities Service, Marathon Oil, Shell Oil, Sun Co., Atlantic Richfield, Getty Oil, Ashland Oil, Continental Oil, Murphy Oil, Standard (Indiana), Union Oil of California, Phillips, Standard (Ohio), El Paso

	1971	1972	1973	1974	1975	1976	1977	1978
<b>ASHLAND OIL, INC.</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	95.3	122.8	141.8	169.8	195.4	227.2	268.9	363.8
Capital expenditures.....	84.6	253.2	176.1	183.7	278.7	252.4	500.8	317.3
Retained cash flow/capital expenditures (percent).....	(112.7)	(48.5)	(80.5)	(92.4)	(70.1)	(90.0)	(53.7)	(114.7)
Issuance of long-term debt.....	0	22.8	22.7	18.0	79.3	11.9	314.8	109.7
Equity issuance.....	NA	NA	NA	NA	3.3	0	65.9	0
Common dividends.....	25.6	26.5	27.6	31.4	34.2	40.3	49.9	55.2
Preferred dividends.....	6.7	7.2	7.1	9.1	10.7	10.6	12.7	13.0
Cash dividends.....	32.4	33.6	34.8	40.4	45.0	50.9	62.6	68.1
<b>Capitalization:</b>								
Total long-term debt.....	298.6	413.3	447.4	462.2	512.0	502.1	686.8	577.2
Preferred stock (carrying value).....	39.8	39.9	35.8	76.8	74.9	59.3	102.5	198.9
Total common equity.....	409.8	467.2	513.8	585.0	650.7	749.7	860.3	951.1
Total capitalization.....	765.1	941.6	1,019.9	1,146.8	1,261.2	1,336.7	1,673.5	1,727.2
<b>Items as a percent of capitalization:</b>								
Total long-term debt.....	39.0	43.9	43.9	40.3	40.6	37.6	41.0	33.4
Preferred stock.....	5.2	4.2	3.5	6.7	5.9	4.4	6.1	11.5
Total common equity.....	53.6	49.6	50.4	51.0	51.6	56.1	51.4	55.1
<b>Income statement data:</b>								
Net income.....	39.2	68.0	85.2	113.0	119.4	136.0	164.3	244.8
Common dividends.....	25.6	26.5	27.6	31.4	34.2	40.3	49.9	55.2
Payout ratio.....	(81.6)	(45.3)	(36.4)	(30.9)	(33.4)	(32.8)	(33.9)	(24.2)
<b>COASTAL STATES GAS CORP.</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	65.5	72.7	112.1	135.5	151.3	172.4	175.9	192.4
Capital expenditures.....	89.9	116.8	122.8	121.6	98.3	214.9	241.9	293.0
Retained cash flow/capital expenditures (percent).....	(72.9)	(62.3)	(91.3)	111.4	(154.0)	(80.2)	(72.7)	(65.7)
Issuance of long-term debt.....	49.5	98.9	60.8	50.1	41.1	185.0	430.8	394.8
Equity issuance.....	.7	2.6	86.1	0	0	0	0	0
Common dividends.....	0	0	0	0	0	0	4.2	5.6
Preferred dividends.....	.8	.8	5.0	5.0	5.0	5.0	5.0	5.0
Cash dividends.....	.8	.8	5.0	5.0	5.0	5.0	9.2	10.8
<b>Capitalization:</b>								
Total long-term debt.....	288.5	321.2	625.7	574.4	549.0	601.0	678.1	806.7
Preferred stock (carrying value).....	2.8	2.8	.9	.9	.9	.9	.9	.9
Total common equity.....	245.7	288.3	428.8	478.9	457.7	511.1	575.5	626.0
Total capitalization.....	537.0	612.3	1,085.1	1,082.4	1,034.3	1,156.4	1,296.4	1,474.1
<b>Items as a percent of capitalization:</b>								
Total long-term debt.....	53.7	52.5	57.7	53.1	53.1	52.0	52.3	54.7
Preferred stock.....	.5	.5	.1	.1	.1	.1	.1	.1
Total common equity.....	45.7	47.1	39.5	44.2	44.3	44.2	44.4	42.5
<b>Income statement data:</b>								
Net income.....	36.7	40.9	38.2	55.1	54.3	58.4	73.2	60.4
Common dividends.....	0	0	0	0	0	0	4.2	5.6
Payout ratio.....	(0)	(0)	(0)	(0)	(0)	(0)	(6.3)	(10.3)
<b>Industry aggregate:</b>								
Retained cash flow.....	262.1	274.1	392.9	535.8	515.9	573.6	557.9	555.8
Capital expenditures.....	323.9	269.8	283.9	730.0	537.3	517.9	444.7	570.0
Retained cash flow/capital expenditures (percent).....	(80.9)	(101.6)	(138.4)	(73.4)	(96.0)	(110.8)	(125.4)	(97.5)
Issuance of long-term debt.....	19.2	105.6	90.4	92.0	71.0	95.0	86.4	60.3
Equity issuance.....	15.4	0	10.2	7.4	6.1	0	0	0
Common dividends.....	31.1	32.4	33.9	37.1	41.1	70.4	107.0	140.9
Preferred dividends.....	39.4	37.2	36.6	36.6	36.5	36.1	24.7	13.1
Cash dividends.....	70.5	69.6	70.5	73.7	77.7	106.5	131.6	153.9

## INTEGRATED DOMESTIC CONSOLIDATED FIRMS—Continued

[Companies included in consolidation are: Amerada Hess, Belco Petroleum, Kerr McGee, Coastal States, Cities Service, Marathon Oil, Shell Oil, Sun Co., Atlantic Richfield, Getty Oil, Ashland Oil, Continental Oil, Murphy Oil, Standard (Indiana), Union Oil of California, Phillips, Standard (Ohio), El Paso]

	1971	1972	1973	1974	1975	1976	1977	1978
<b>Capitalization:</b>								
Total long-term debt.....	495.4	568.9	627.4	678.9	657.3	732.0	737.9	799.3
Preferred stock (carrying value).....	17.1	16.3	16.3	16.2	16.2	15.1	6.4	5.1
Total common equity.....	1,696.6	1,743.9	1,913.4	2,230.6	2,375.1	2,540.0	2,754.1	2,943.9
Total capitalization.....	2,213.0	2,329.1	2,557.0	2,925.7	3,048.6	3,287.1	3,498.4	3,748.3
<b>Items as a percentage of capitalization:</b>								
Total long-term debt.....	22.4	24.4	24.5	23.2	21.6	22.3	21.1	21.3
Preferred stock.....	.8	.7	.6	.6	.5	.5	.2	.1
Total common equity.....	76.7	74.9	74.8	76.2	77.9	77.3	78.7	78.5
<b>Income statement data:</b>								
Net income.....	151.6	154.7	229.7	377.7	220.1	356.2	361.9	365.4
Common dividends.....	31.1	32.4	33.9	37.1	41.1	70.4	107.0	140.9
Payout ratio.....	(27.8)	(27.6)	(17.6)	(10.9)	(22.5)	(22.0)	(31.1)	(40.0)
<b>SHELL OIL CO.</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	500.4	506.9	623.4	974.6	936.6	1,244.4	1,343.9	1,373.6
Capital expenditures.....	450.5	590.9	580.6	929.2	1,075.5	1,384.3	1,818.8	1,774.4
Retained cash flow/capital expenditures (percent).....	(111.1)	(85.8)	(107.4)	(104.9)	(87.3)	(89.9)	(73.9)	(77.4)
Issuance of long-term debt.....	26.0	214.0	31.5	19.6	263.6	28.4	413.8	71.5
Equity issuance.....	.3	.2	10.2	12.6	57.5	124.1	167.7	172.7
Common dividends.....	161.7	161.8	161.7	165.1	220.7	150.1	229.0	267.6
Preferred dividends.....	0	0	0	0	0	0	0	0
Cash dividends.....	161.7	161.8	161.7	165.1	220.7	150.1	229.0	267.6
<b>Capitalization:</b>								
Total long-term debt.....	836.8	1,025.6	1,020.9	976.6	1,202.1	1,175.2	1,500.9	1,572.7
Preferred stock (carrying value).....	0	0	0	0	0	0	0	0
Total common equity.....	2,826.0	2,925.0	3,095.1	3,559.7	3,911.4	4,591.2	5,265.0	6,105.8
Total capitalization.....	3,662.8	3,950.5	4,115.9	4,536.3	5,113.4	5,766.3	6,765.9	7,678.5
<b>Items as a percent of capitalization:</b>								
Total long-term debt.....	22.8	26.0	24.8	21.5	23.5	20.4	22.2	20.5
Preferred stock.....	0	0	0	0	0	0	0	0
Total common equity.....	77.2	74.0	75.2	78.5	76.5	79.6	77.8	79.5
<b>Income statement data:</b>								
Net income.....	244.5	260.5	332.7	620.5	514.8	705.8	735.1	813.6
Common dividends.....	161.7	161.8	161.7	165.1	220.7	150.1	229.0	267.6
Payout ratio.....	(66.1)	(62.2)	(48.6)	(26.6)	(34.3)	(27.7)	(31.3)	(33.0)
<b>MARATHON OIL CO.</b>								
<b>Industry aggregated:</b>								
Retained cash flow.....	142.3	136.7	211.9	244.3	214.9	295.3	391.0	434.4
Capital expenditures.....	94.4	138.5	128.5	249.4	230.9	345.5	481.1	502.3
Retained cash flow/capital expenditures (percent).....	(150.8)	(98.7)	(164.9)	(97.9)	(93.1)	(85.5)	(81.3)	(86.5)
Issuance of long-term debt.....	55.6	43.2	12.6	21.3	68.2	788.4	169.6	263.1
Equity issuance.....	4.4	.6	1.1	.5	2.9	0	0	0
Common dividends.....	47.9	47.9	47.9	53.9	53.8	58.6	66.2	66.5
Preferred dividends.....	0	0	0	0	0	0	0	0
Cash dividends.....	47.9	47.9	47.9	53.9	53.8	58.6	66.2	66.5
<b>Capitalization:</b>								
Total long-term debt.....	294.2	318.4	252.9	207.8	249.5	1,032.2	1,008.0	1051.8
Preferred stock (carrying value).....	0	0	0	0	0	0	0	0
Total common equity.....	760.9	787.3	886.0	996.5	1,011.7	1,150.5	1,286.7	1,447.5
Total capitalization.....	1,055.1	1,105.7	1,138.9	1,204.3	1,261.2	2,182.7	2,294.7	2,499.4
<b>Items as a percentage of capitalization:</b>								
Total long-term debt.....	27.9	28.8	22.2	17.3	19.8	47.3	43.9	42.1
Preferred stock.....	0	0	0	0	0	0	0	0
Total common equity.....	72.1	71.2	77.8	82.7	80.2	52.7	56.1	57.9

## INTEGRATED DOMESTIC CONSOLIDATED FIRMS—Continued

[Companies included in consolidation are: Amerada Hess, Belco Petroleum, Kerr McGee, Coastal States, Cities Service Marathon Oil, Shell Oil, Sun Co., Atlantic Richfield, Getty Oil, Ashland Oil, Continental Oil, Murphy Oil, Standard (Indiana), Union Oil of California, Phillips, Standard (Ohio), El Paso]

	1971	1972	1973	1974	1975	1976	1977	1978
<b>CITIES SERVICE CO.</b>								
<b>Income statement data:</b>								
Net income	88.7	79.8	129.4	170.5	128.1	195.8	197.0	197.1
Common dividends	47.9	47.9	47.9	53.9	53.8	58.6	66.2	66.5
Payout ratio	(54.1)	(59.9)	(37.0)	(31.6)	(42.1)	(29.9)	(33.6)	(33.7)
<b>Industry aggregate:</b>								
Retained cash flow	185.8	243.6	242.4	381.8	342.5	458.6	438.6	529.7
Capital expenditures	296.5	261.7	402.2	446.9	435.9	524.3	500.0	636.1
Retained cash flow/capital expenditures (percent)	(62.7)	(93.1)	(60.3)	(85.4)	(78.6)	(87.5)	(87.7)	(83.3)
Issuance of long-term debt	222.0	22.3	53.9	18.1	243.7	132.8	182.8	159.9
Equity issuance	6.1	12.9	6.7	.8	4.0	20.1	14.5	1.2
Common dividends	61.6	56.7	57.3	61.0	64.5	70.7	82.7	85.8
Preferred dividends	0	0	0	0	0	0	0	0
Cash dividends	61.6	56.7	57.3	61.0	64.5	70.7	82.7	85.8
<b>Capitalization:</b>								
Total long-term debt	562.8	564.0	610.4	569.3	767.9	791.7	937.7	1,055.1
Preferred stock (carrying value)	0	0	0	0	0	0	0	0
Total common equity	1,365.5	1,433.8	1,530.1	1,673.7	1,631.8	1,798.2	1,937.6	1,971.0
Total capitalization	1,935.6	2,004.8	2,139.9	2,250.4	2,406.7	2,597.5	2,883.5	3,036.3
<b>Items as a percent of capitalization:</b>								
Total long-term debt	29.1	28.1	28.1	25.3	31.9	30.5	32.5	34.8
Preferred stock	0	0	0	0	0	0	0	0
Total common equity	70.5	71.5	71.5	74.4	67.8	69.2	67.2	64.9
<b>Income statement data:</b>								
Net income	104.5	99.1	135.6	203.8	137.7	217.0	210.2	118.0
Common dividends	61.6	56.7	57.3	61.0	64.5	70.7	82.7	85.8
Payout ratio	(58.2)	(57.3)	(42.2)	(29.9)	(46.9)	(32.6)	(39.4)	(72.6)
<b>EL PASO CO.</b>								
<b>Industry aggregate:</b>								
Retained cash flow	131.7	155.7	224.1	237.6	287.8	189.5	247.9	258.0
Capital expenditures	163.2	111.3	184.1	237.2	445.1	330.9	325.2	383.1
Retained cash flow/capital expenditures (percent)	(80.7)	(139.8)	(121.7)	(100.2)	(64.7)	(57.3)	(76.2)	(67.3)
Issuance of long-term debt	NA	NA	NA	34.0	449.0	295.7	205.8	79.0
Equity issuance	27.9	NA	NA	0	61.6	82.5	67.5	86.3
Common dividends	27.1	27.6	27.9	27.9	33.7	41.4	45.3	51.6
Preferred dividends	6.4	6.8	7.5	0	0	0	0	0
Cash dividends	33.6	34.5	35.4	27.9	33.7	41.4	45.3	51.6
<b>Capitalization:</b>								
Total long-term debt	1,116.4	1,130.4	877.6	850.1	1,201.8	1,380.0	1,414.7	1,408.6
Preferred stock (carrying value)	85.9	107.2	105.6	0	0	0	0	0
Total common equity	443.6	466.4	411.5	457.0	529.5	573.5	687.8	702.5
Total capitalization	1,655.0	1,712.8	1,403.3	1,418.0	1,834.4	2,054.4	2,200.6	2,281.8
<b>Items as a percent of capitalization:</b>								
Total long-term debt	67.5	66.0	62.5	59.9	65.5	67.2	64.3	61.7
Preferred stock	5.2	6.3	7.5	0	0	0	0	0
Total common equity	26.8	27.2	29.3	32.2	28.9	27.9	31.3	30.8
<b>Income statement data:</b>								
Net income	64.1	63.9	53.1	73.0	58.2	73.4	92.1	108.7
Common dividends	27.1	27.6	27.9	27.9	33.7	41.4	45.3	51.6
Payout ratio	(47.2)	(48.8)	(61.0)	(38.3)	(58.5)	(55.6)	(49.1)	(47.3)
<b>KERR-McGEE CORP.</b>								
<b>Industry aggregate:</b>								
Retained cash flow	88.0	112.0	109.4	171.3	189.5	206.0	226.3	247.1
Capital expenditures	69.9	76.1	113.0	163.9	234.7	261.0	269.2	270.2
Retained cash flow/capital expenditures (percent)	(125.9)	(147.3)	(96.7)	(104.5)	(80.7)	(78.9)	(84.1)	(91.5)
Issuance of long-term debt	23.5	23.2	4.9	62.8	85.3	132.0	.3	.4
Equity issuance	2.3	94.9	29.8	.9	68.1	1.7	.2	.4
Common dividends	12.2	14.0	14.7	21.3	25.4	30.7	32.3	32.3
Preferred dividends	1.2	1.2	.9	0	0	0	0	0
Cash dividends	13.4	15.2	15.6	21.3	25.4	30.7	32.3	32.3

## INTEGRATED DOMESTIC CONSOLIDATED FIRMS—Continued

[Companies included in consolidation are: Amerada Hess, Belco Petroleum, Kerr McGee, Coastal States, Cities Service Marathon Oil, Shell Oil, Sun Co., Atlantic Richfield, Getty Oil, Ashland Oil, Continental Oil, Murphy Oil, Standard (Indiana), Union Oil of California, Phillips, Standard (Ohio), El Paso]

	1971	1972	1973	1974	1975	1976	1977	1978
<b>Capitalization:</b>								
Total long-term debt.....	225.7	124.4	122.8	158.6	216.4	321.2	299.4	255.3
Preferred stock (carrying value).....	27.2	26.5	0	0	0	0	0	0
Total common equity.....	351.5	481.8	558.6	654.7	807.9	913.1	1,002.8	1,088.8
Total capitalization.....	609.2	639.1	688.8	822.0	1,039.0	1,253.9	1,324.9	1,369.2
<b>Items as a percentage of capitalization:</b>								
Total long-term debt.....	37.0	19.5	17.8	19.3	20.8	25.6	22.6	18.6
Preferred stock.....	4.5	4.1	0	0	0	0	0	0
Total, common equity.....	57.7	75.4	81.1	79.6	77.8	72.8	75.7	79.5
<b>Income statement data:</b>								
Net income.....	40.7	50.6	62.8	116.4	131.1	134.1	119.2	118.2
Common dividends.....	12.1	14.0	14.7	21.3	25.4	30.7	32.3	32.3
Payout ratio.....	(31.1)	(28.0)	(23.8)	(18.3)	(19.4)	(22.9)	(27.1)	(27.4)
<b>BELCO PETROLEUM CORP.</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	20.8	21.3	27.1	63.8	42.2	2.1	68.2	82.3
Capital expenditures.....	28.3	27.3	21.2	55.7	56.5	46.0	56.0	64.5
Retained cash flow/capital expenditures (percent).....	(73.3)	(78.1)	(127.6)	(114.5)	(74.7)	(113.3)	(121.7)	(127.6)
Issuance of long-term debt.....	29.3	17.6	17.2	0	15.9	3.4	0	7.7
Equity issuance.....	0	0	0	0	0	0	0	0
Common dividends.....	3.4	1.8	0	3.8	4.5	5.3	7.6	8.4
Preferred dividends.....	0	0	0	0	0	0	0	0
Cash dividends.....	3.4	1.8	0	3.8	4.5	5.3	7.6	8.4
<b>Capitalization:</b>								
Total long-term debt.....	58.0	68.8	61.4	68.2	72.8	66.3	51.8	51.5
Preferred stock (carrying value).....	0	0	0	0	0	0	0	0
Total common equity.....	94.6	101.8	116.8	156.2	173.0	199.2	234.9	282.7
Total capitalization.....	152.5	170.6	178.2	224.4	245.8	265.5	286.7	334.2
<b>Items as a percent of capitalization:</b>								
Total long-term debt.....	38.0	40.3	34.4	30.4	29.6	25.0	18.1	15.4
Preferred stock.....	0	0	0	0	0	0	0	0
Total common equity.....	62.0	59.7	65.6	69.6	70.4	75.0	81.9	84.6
<b>Income statement data:</b>								
Net income.....	11.0	9.8	15.0	43.2	21.2	31.4	42.2	55.6
Common dividends.....	3.4	1.8	0	3.8	4.5	5.3	7.6	8.4
Payout ratio.....	(31.4)	(18.2)	(0)	(8.7)	(21.2)	(16.9)	(18.1)	(15.2)
Dividends per share.....	.5	.3	0	.6	.7	.7	1.0	1.1
Earnings per share.....	1.6	1.4	2.0	5.8	2.8	4.1	5.5	7.2
<b>AMERADA HESS CORP.</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	216.5	148.0	323.2	327.4	258.1	298.0	360.9	340.1
Capital expenditures.....	175.7	142.1	242.0	417.2	283.2	291.3	421.6	353.3
Retained cash flow/capital expenditures (percent).....	(123.3)	(104.1)	(133.6)	(78.5)	(91.1)	(102.3)	(85.6)	(96.2)
Issuance of long-term debt.....	229.9	107.1	162.5	128.0	282.2	253.0	298.5	42.7
Equity issuance.....	0	2.7	0	0	0	0	0	0
Common dividends.....	5.1	6.0	6.4	6.6	6.7	8.7	18.5	26.7
Preferred dividends.....	30.5	25.4	23.9	23.7	23.7	23.7	23.0	19.5
Cash dividends.....	35.6	31.4	30.3	30.3	30.5	32.4	41.5	46.2
<b>Capitalization:</b>								
Total long-term debt.....	427.9	438.2	558.5	641.2	638.2	681.7	753.1	748.9
Preferred stock (carrying value).....	7.6	6.9	6.8	6.8	6.8	6.8	6.0	4.3
Total common equity.....	548.1	547.6	766.8	938.4	1,036.3	1,155.1	1,293.7	1,387.8
Total capitalization.....	983.6	992.7	1,332.1	1,586.4	1,681.3	1,843.5	2,052.8	2,141.0
<b>Items as a percent of capitalization:</b>								
Total long-term debt.....	43.5	44.1	41.9	40.4	38.0	37.0	36.7	34.9
Preferred stock.....	.8	.7	.5	.4	.4	.4	.3	.2
Total common equity.....	55.7	55.2	57.6	59.2	61.6	62.7	63.0	64.8
<b>Income statement data:</b>								
Net income.....	133.2	46.2	245.3	201.9	128.4	152.6	178.9	142.5
Common dividends.....	5.1	6.0	6.4	6.6	6.7	8.7	18.5	26.7
Payout ratio.....	(8.1)	(23.6)	(4.5)	(5.6)	(8.9)	(9.5)	(16.5)	(27.1)

## DOMESTIC CONSOLIDATED FIRMS

[Companies included in consolidation are: Reserve Oil & Gas, Mesa Petroleum, Texas Oil & Gas, General American Oil, Superior Oil, Panhandle Eastern, Houston Oil & Minerals, Pennzoil, Louisiana Land & Exploration]

	1971	1972	1973	1974	1975	1976	1977	1978
<b>Industry aggregate:</b>								
Retained cash flow.....	\$324.9	\$414.9	\$492.6	\$717.4	\$734.9	\$971.1	\$1,083.3	\$1,354.7
Capital expenditures.....	322.5	570.0	815.2	938.4	906.9	965.9	1,386.6	1,882.7
Retained cash flow/capital expenditures (percent).....	(100.7)	(78.3)	(60.4)	(76.4)	(81.0)	(100.5)	(78.1)	(71.9)
Issuance of long-term debt.....	391.9	542.6	305.9	478.7	803.9	733.7	645.2	1,143.6
Equity issuance.....	33.3	19.6	153.7	1.3	75.3	102.4	81.9	108.1
Common dividends.....	87.8	81.7	93.7	114.5	135.6	137.5	188.0	214.4
Preferred dividends.....	16.0	14.5	16.8	9.6	12.2	13.1	10.8	13.4
Cash dividends.....	103.8	104.2	110.5	124.1	149.1	149.4	198.2	227.8
<b>Capitalization:</b>								
Total long-term debt.....	1,431.1	1,682.0	1,852.4	2,115.4	2,345.5	2,429.3	2,728.7	3,095.7
Preferred stock (carrying value).....	54.2	52.8	51.8	44.5	46.3	40.7	34.1	35.0
Total common equity.....	1,623.7	1,820.6	2,233.5	2,436.4	2,770.7	3,286.2	3,825.0	4,125.1
Total capitalization.....	3,201.5	3,679.7	4,270.5	4,810.8	5,419.8	5,925.4	6,810.2	7,458.9
<b>Items as a percent of capitalization:</b>								
Total long-term debt.....	44.7	45.7	43.4	44.0	43.3	41.0	40.1	41.5
Preferred stock.....	1.7	1.4	1.2	.9	.9	.7	.5	.5
Total common equity.....	50.7	49.5	52.3	50.6	51.1	55.5	56.2	55.3
<b>Income statement data:</b>								
Net income.....	188.8	231.8	311.5	463.2	435.5	538.8	601.5	602.0
Common dividends.....	87.8	89.7	93.7	114.5	135.6	137.5	188.0	214.3
Payout ratio.....	(40.2)	(34.3)	(24.9)	(18.0)	(21.8)	(22.8)	(23.2)	(33.2)
Dividends per share.....	5.7	5.7	5.8	6.7	7.4	8.3	9.6	10.7
Earnings per share.....	14.3	16.7	23.3	37.0	34.1	36.4	41.2	32.2
<b>LOUISIANA LAND &amp; EXPLORATION</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	47.0	53.9	69.3	120.6	108.4	135.2	157.1	191.9
Capital expenditures.....	47.7	107.4	78.8	120.0	117.6	108.1	146.6	191.8
Retained cash flow/capital expenditures (percent).....	(98.5)	(50.2)	(88.0)	(100.5)	(92.2)	(125.1)	(107.2)	(100.0)
Issuance of long-term debt.....	1.1	89.0	0	0	7.4	18.3	2.9	4.6
Equity issuance.....	0	0	0	0	0	0	0	0
Common dividends.....	36.0	36.2	36.6	38.4	40.6	42.8	45.0	46.4
Preferred dividends.....	0	0	0	0	0	0	0	0
Cash dividends.....	36.0	36.2	36.6	38.4	40.6	42.8	45.0	46.4
<b>Capitalization:</b>								
Total long-term debt.....	28.2	97.2	91.5	147.5	148.7	174.7	198.1	127.7
Preferred stock (carrying value).....	0	0	0	0	0	0	0	0
Total common equity.....	187.5	221.9	255.4	323.6	343.6	397.6	495.4	549.4
Total capitalization.....	215.7	324.9	352.6	474.7	494.5	573.7	695.4	679.4
<b>Items as a percentage of capitalization:</b>								
Total long-term debt.....	13.1	29.9	25.9	31.1	30.1	30.5	28.5	18.7
Preferred stock.....	0	0	0	0	0	0	0	0
Total common equity.....	86.9	68.3	72.4	68.2	69.5	69.3	71.2	80.9
<b>Income statement data:</b>								
Net income.....	59.7	63.0	70.2	108.0	87.7	96.7	98.1	100.4
Common dividends.....	36.0	36.2	36.6	38.4	40.6	42.8	45.0	46.4
Payout ratio.....	(60.0)	(57.5)	(52.1)	(35.6)	(46.3)	(44.2)	(45.5)	(46.2)
<b>SUPERIOR OIL CO.</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	39.4	41.5	47.0	115.4	91.6	109.3	127.4	128.3
Capital expenditures.....	33.0	49.2	92.4	83.5	80.4	84.4	152.8	223.7
Retained cash flow/capital expenditures (percent).....	(119.5)	(84.4)	(50.9)	(138.1)	(113.9)	(129.4)	(83.4)	(57.4)
Issuance of long-term debt.....	14.2	21.7	58.9	28.4	27.4	.9	21.3	342.5
Equity issuance.....	0	0	0	0	0	0	0	0
Common dividends.....	5.7	5.6	5.6	5.6	6.4	7.2	7.6	10.0
Preferred dividends.....	0	0	0	0	0	0	0	0
Cash dividends.....	5.7	5.6	5.6	5.6	6.4	7.2	7.6	10.0

## DOMESTIC CONSOLIDATED FIRMS—Continued

[Companies included in consolidation are: Reserve Oil & Gas, Mesa Petroleum, Texas Oil & Gas, General American Oil, Superior Oil, Panhandle Eastern, Houston Oil & Minerals, Pennzoil, Louisiana Land & Exploration]

	1971	1972	1973	1974	1975	1976	1977	1978
<b>Capitalization:</b>								
Total long-term debt.....	89.9	95.5	145.8	130.4	96.7	76.7	85.0	381.4
Preferred stock (carrying value).....	0	0	0	0	0	0	0	0
Total common equity.....	319.1	333.0	360.8	494.2	541.8	584.7	642.8	677.7
Total capitalization.....	408.9	428.5	506.6	690.0	719.7	761.1	877.8	1,222.3
<b>Items as a percent of capitalization:</b>								
Total long-term debt.....	22.0	22.3	28.8	18.9	13.4	10.1	9.7	31.2
Preferred stock.....	0	0	0	0	0	0	0	0
Total common equity.....	78.0	77.7	71.2	71.6	75.3	76.8	73.2	55.4
<b>Income statement data:</b>								
Net income.....	4.3	5.1	32.7	61.0	51.9	50.4	62.5	30.9
Common dividends.....	5.7	5.6	5.6	5.6	6.4	7.2	7.6	10.0
Payout ratio.....	(137.1)	(110.2)	(17.3)	(9.2)	(12.4)	(14.3)	(12.2)	(32.4)
Dividends per share.....	1.4	1.4	1.4	1.4	1.6	1.8	1.9	2.5
Earnings per share.....	1.1	1.3	8.1	15.2	12.9	12.6	15.6	7.7
<b>GENERAL AMERICAN OIL CO. OF TEXAS</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	38.0	32.5	33.0	40.3	44.6	53.1	54.8	70.7
Capital expenditures.....	32.4	22.4	34.4	33.9	42.0	64.2	57.8	86.4
Retained cash flow/capital expenditures (percent).....	(117.3)	(145.3)	(96.0)	(118.9)	(105.4)	(82.7)	(94.9)	(81.8)
Issuance of long-term debt.....	0	2.1	14.1	0	0	20.0	0	0
Equity issuance.....	0	0	0	0	0	0	0	0
Common dividends.....	3.5	3.6	3.7	3.8	5.2	5.7	6.9	7.9
Preferred dividends.....	0	0	0	0	0	0	0	0
Cash dividends.....	3.5	3.6	3.7	3.8	5.2	5.7	6.9	7.9
<b>Capitalization:</b>								
Total long-term debt.....	0	1.1	15.0	15.0	14.6	29.3	24.4	17.0
Preferred stock (carrying value).....	0	0	0	0	0	0	0	0
Total common equity.....	208.5	220.7	226.3	246.5	264.6	280.2	300.4	314.6
Total capitalization.....	208.5	221.8	241.3	261.5	279.2	309.5	324.9	331.6
<b>Items as a percent of capitalization:</b>								
Total long-term debt.....	0	0.5	6.2	5.7	5.2	9.5	7.5	5.1
Preferred stock.....	0	0	0	0	0	0	0	0
Total common equity.....	100.0	99.5	93.8	94.3	94.8	90.5	92.5	94.9
<b>Income statement data:</b>								
Net income.....	8.5	15.4	11.1	24.0	23.3	23.3	27.2	23.1
Common dividends.....	3.5	3.6	3.7	3.8	5.2	5.7	6.9	7.9
Payout ratio.....	(39.9)	(22.7)	(32.7)	(15.5)	(21.9)	(24.0)	(24.9)	(34.2)
<b>TEXAS OIL &amp; GAS CORP.</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	13.0	18.0	25.9	40.0	67.5	91.7	139.5	171.0
Capital expenditures.....	33.2	37.1	53.2	83.3	111.5	106.3	196.5	240.9
Retained cash flow/capital expenditures (percent).....	(39.3)	(48.5)	(48.8)	(48.1)	(60.5)	(86.2)	(71.0)	(71.0)
Issuance of long-term debt.....	33.7	41.3	39.7	59.6	104.0	11.8	125.3	196.1
Equity issuance.....	12.0	15.0	0	0	0	0	0	0
Common dividends.....	.2	.2	.2	.2	.2	3.9	4.3	5.9
Preferred dividends.....	0	0	0	0	0	0	0	0
Cash dividends.....	.2	.2	.2	.2	.2	3.9	4.3	5.9
<b>Capitalization:</b>								
Total long-term debt.....	58.3	61.9	87.2	128.7	185.8	185.8	246.9	344.4
Preferred stock (carrying value).....	0	0	0	0	0	0	0	0
Total common equity.....	69.4	95.9	113.5	139.2	179.2	223.5	266.0	359.4
Total capitalization.....	127.7	157.8	200.7	267.9	365.0	409.2	532.9	703.8
<b>Items as a percentage of capitalization:</b>								
Total long-term debt.....	45.6	39.2	43.4	48.0	50.9	45.4	46.3	48.9
Preferred stock.....	0	0	0	0	0	0	0	0
Total common equity.....	54.4	60.8	56.6	52.0	49.1	54.6	53.7	51.1



## DOMESTIC CONSOLIDATED FIRMS—Continued

[Companies included in consolidation are: Reserve Oil & Gas, Mesa Petroleum, Texas Oil & Gas, General American Oil, Superior Oil, Panhandle Eastern, Houston Oil & Minerals, Pennzoil, Louisiana Land[& Exploration]

	1971	1972	1973	1974	1975	1976	1977	1978
<b>Income statement data:</b>								
Net income.....	9.0	12.2	16.5	25.9	40.1	48.2	66.7	78.9
Common dividends.....	.2	.2	.2	.2	.2	3.9	4.3	5.9
Payout ratio.....	(4.3)	(1.8)	(1.4)	(.9)	(.6)	(8.1)	(6.5)	(7.5)
<b>HOUSTON OIL &amp; MINERALS CORP.</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	1.8	2.7	5.0	17.2	28.8	71.0	143.6	161.9
Capital expenditures.....	8.1	7.2	29.9	44.7	71.9	163.0	229.0	215.0
Retained cash flow/capital expenditures (percent)...	(23.0)	(36.9)	(16.9)	(38.4)	(40.0)	(43.6)	(62.7)	(75.3)
Issuance of long-term debt.....	5.5	11.0	27.6	23.0	126.2	168.2	135.3	89.8
Equity issuance.....	.6	1.9	3.2	1.0	4.0	22.0	7.9	80.8
Common dividends.....	0	0	0	2.4	3.1	8.9	19.0	23.2
Preferred dividends.....	0	0	0	0	0	0	0	2.5
Cash dividends.....	0	0	0	2.5	3.2	8.9	19.0	25.7
<b>Capitalization:</b>								
Total long-term debt.....	5.2	11.7	33.1	50.7	119.6	187.2	279.2	236.2
Preferred stock (carrying value).....	0	0	0	0	0	0	0	3.0
Total common equity.....	3.6	6.7	13.5	28.0	38.5	89.9	144.7	213.6
Total capitalization.....	8.8	18.4	46.7	78.8	158.1	277.2	423.9	452.8
<b>Items as a percent of capitali- zation:</b>								
Total long-term debt.....	58.9	63.2	70.9	64.4	75.6	67.5	65.9	52.1
Preferred stock.....	.5	.3	.1	.1	0	0	0	.7
Total common equity.....	40.5	36.6	29.0	35.6	24.3	32.4	34.1	47.8
<b>Income statement data:</b>								
Net income.....	.8	1.2	3.6	16.0	17.1	38.4	65.9	55.6
Common dividends.....	0	0	0	2.4	3.1	8.9	19.0	23.2
Payout ratio.....	(0)	(0)	(0)	(15.6)	(18.7)	(23.4)	(29.4)	(43.9)
<b>MESA PETROLEUM</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	16.7	21.5	25.8	36.8	41.2	68.9	97.9	109.1
Capital expenditures.....	17.8	82.3	115.7	119.3	100.6	108.7	185.8	194.3
Retained cash flow/capital expenditures (percent)...	(93.6)	(26.1)	(22.3)	(30.9)	(41.0)	(63.4)	(52.7)	(56.2)
Issuance of long-term debt.....	8.4	63.0	NA	NA	29.9	79.4	178.1	147.3
Equity issuance.....	6.9	.9	73.6	.3	71.1	1.2	2.5	0
Common dividends.....	.3	.4	1.0	.6	.6	1.3	5.4	5.4
Preferred dividends.....	1.5	1.3	1.1	.2	3.3	4.9	2.4	0
Cash dividends.....	1.8	1.6	2.1	.8	3.9	6.2	7.2	5.4
<b>Capitalization:</b>								
Total long-term debt.....	33.5	91.8	76.7	144.2	145.2	210.9	300.7	384.7
Preferred stock (carrying value).....	.6	.5	.4	.1	3.1	3.0	0	0
Total common equity.....	49.3	63.9	185.2	190.1	273.4	297.5	337.2	374.4
Total capitalization.....	83.5	156.3	262.3	334.3	421.7	511.4	637.9	759.1
<b>Items as a percent of capitali- zation:</b>								
Total long-term debt.....	40.2	58.7	29.2	43.1	34.4	41.2	47.1	50.7
Preferred stock.....	.7	.4	.2	0	.7	.6	0	0
Total, common equity.....	59.1	40.9	70.6	56.9	64.8	58.2	52.9	49.3
<b>Income statement data:</b>								
Net income.....	12.7	15.2	19.1	24.9	19.2	30.7	41.3	41.8
Common dividends.....	.3	.4	1.0	.6	.6	1.3	5.4	5.4
Payout ratio.....	(3.3)	(3.1)	(2.9)	(2.6)	(4.0)	(5.0)	(9.4)	(16.7)
<b>PANHANDLE EASTERN PIPE LINE</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	84.2	97.2	105.2	121.8	133.9	155.7	180.1	215.6
Capital expenditures.....	51.4	78.1	103.9	148.6	116.6	143.2	169.0	321.8
Retained cash flow/capital expenditures (percent)...	(163.9)	(124.4)	(101.2)	(82.0)	(114.8)	(108.7)	(106.6)	(67.0)
Issuance of long-term debt.....	12.5	99.7	94.2	147.2	191.7	96.6	18.0	114.1
Equity issuance.....	8.0	.8	.2	0	0	78.1	23.8	21.3
Common dividends.....	26.0	26.4	27.9	29.0	29.7	33.2	42.2	47.3
Preferred dividends.....	2.6	2.6	2.6	2.5	2.4	2.3	2.2	2.0
Cash dividends.....	29.6	29.0	30.5	31.5	32.1	35.5	44.4	49.3

## DOMESTIC CONSOLIDATED FIRMS—Continued

[Companies included in consolidation are: Reserve Oil & Gas, Mesa Petroleum, Texas Oil & Gas, General American Oil, Superior Oil, Panhandle Eastern, Houston Oil & Minerals, Pennzoil, Louisiana Land & Exploration]

	1971	1972	1973	1974	1975	1976	1977	1978
<b>Capitalization:</b>								
Total long-term debt.....	562.9	540.8	595.7	684.1	798.7	746.4	687.1	723.1
Preferred stock (carrying value).....	39.1	38.5	37.8	35.6	35.0	33.3	31.0	29.4
Total common equity.....	269.6	327.5	377.4	415.2	455.7	586.6	672.7	766.2
Total capitalization.....	911.6	946.1	1,049.6	1,172.9	1,325.5	1,400.8	1,424.3	1,549.4
<b>Items as a percentage of capitalization:</b>								
Total long-term debt.....	61.8	57.2	56.8	58.3	60.3	53.3	48.2	46.7
Preferred stock.....	4.3	4.1	3.6	3.0	2.6	2.4	2.2	2.0
Total common equity.....	29.6	34.6	36.0	35.4	34.4	41.9	47.2	49.5
<b>Income statement data:</b>								
Net income.....	42.9	57.0	64.4	69.0	72.3	88.0	106.4	122.9
Common dividends.....	26.0	26.4	27.9	29.0	29.7	33.2	42.2	47.3
Payout ratio.....	(64.3)	(48.5)	(45.2)	(43.6)	(42.4)	(39.4)	(40.4)	(39.5)
<b>PENNZOIL CO.</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	78.3	127.6	157.3	200.7	193.9	255.7	149.8	263.3
Capital expenditures.....	90.0	126.2	292.7	285.8	241.6	157.1	207.3	331.3
Retained cash flow/capital expenditures (percent).....	(87.0)	(101.1)	(53.7)	(70.2)	(80.3)	(162.7)	(72.3)	(79.5)
Issuance of long-term debt.....	314.3	213.0	52.0	211.9	300.2	212.0	158.0	226.0
Equity issuance.....	0	0	75.3	0	0	0	0	0
Common dividends.....	16.2	17.2	18.6	33.1	48.2	32.5	54.9	65.0
Preferred dividends.....	11.5	19.2	12.7	6.5	6.1	5.7	5.8	5.4
Cash dividends.....	27.6	27.5	31.3	39.6	55.6	36.9	60.7	70.4
<b>Capitalization:</b>								
Total long-term debt.....	645.2	773.4	791.4	797.4	815.5	729.6	822.1	778.9
Preferred stock (carrying value).....	6.7	6.0	5.8	1.1	1.1	1.0	1.0	.6
Total common equity.....	463.6	495.4	622.0	513.9	572.3	703.8	759.5	663.5
Total capitalization.....	1,165.3	1,351.2	1,503.1	1,416.7	1,523.0	1,462.2	1,612.9	1,444.4
<b>Items as a percent of capitalization:</b>								
Total long-term debt.....	55.4	57.2	52.6	56.3	53.5	49.9	51.0	53.9
Preferred stock.....	.6	.4	.4	.1	.1	.1	.1	.0
Total common equity.....	39.8	36.7	41.4	36.3	37.6	48.1	47.1	45.9
<b>Income statement data:</b>								
Net income.....	47.2	58.7	83.7	120.8	106.8	148.0	115.5	128.2
Common dividends.....	16.2	17.2	18.6	33.1	48.2	32.5	54.9	65.0
Payout ratio.....	(55.2)	(44.4)	(32.9)	(30.3)	(39.5)	(30.3)	(50.9)	(53.5)
<b>RESERVE OIL &amp; GAS</b>								
<b>Industry aggregate:</b>								
Retained cash flow.....	6.4	10.0	24.0	24.7	25.0	30.6	33.0	42.9
Capital expenditures.....	9.0	7.0	14.2	19.5	24.7	30.8	41.9	77.5
Retained cash flow/capital expenditures (percent).....	(71.3)	(142.7)	(168.2)	(126.7)	(100.9)	(99.1)	(78.8)	(55.4)
Issuance of long-term debt.....	2.3	1.7	19.5	8.7	17.1	126.4	6.3	23.1
Equity issuance.....	5.9	.1	1.5	0	.2	1.1	47.7	5.9
Common dividends.....	0	0	0	1.2	1.5	2.0	2.6	3.2
Preferred dividends.....	.4	.4	.4	.4	.4	.3	.4	3.5
Cash dividends.....	.4	.4	.4	1.7	1.9	2.3	3.0	6.7
<b>Capitalization:</b>								
Total long-term debt.....	8.0	8.7	16.1	17.5	20.7	88.6	85.2	102.1
Preferred stock (carrying value).....	7.7	7.7	7.7	7.7	7.2	3.2	2.0	2.0
Total common equity.....	53.3	55.6	79.3	85.7	101.6	122.6	186.3	206.3
Total capitalization.....	71.6	74.8	107.6	114.0	133.1	220.3	280.2	316.2
<b>Items as a percent of capitalization:</b>								
Total long-term debt.....	11.1	11.6	15.0	15.3	15.6	40.2	30.4	32.3
Preferred stock.....	10.8	10.3	7.1	6.7	5.4	1.5	.7	.6
Total common equity.....	74.4	74.2	73.7	75.2	76.3	55.6	66.5	65.2
<b>Income statement data:</b>								
Net income.....	3.7	4.0	10.3	13.7	17.0	15.1	17.9	20.3
Common dividends.....	0	0	0	1.2	1.5	2.0	2.6	3.2
Payout ratio.....	(0)	(0)	(0)	(9.3)	(8.9)	(13.9)	(15.5)	(19.2)

Senator GRAVEL. Dr. Wallace?

**STATEMENTS OF JAMES P. WALLACE, VICE PRESIDENT, ENERGY ECONOMICS DIVISION, CHASE MANHATTAN BANK, AND HAROLD D. HAMMAR, VICE PRESIDENT, PETROLEUM DIVISION, CHASE MANHATTAN BANK**

Mr. WALLACE. Mr. Chairman and members of the subcommittee, I am James P. Wallace III, vice president and division executive of the Energy Economics and Automotive Divisions of the Chase Manhattan Bank, and with me today is Harold Hammer, vice president and division executive of the Chase's Petroleum Division.

Senator GRAVEL. What happened to our good friend, John Winger? Is he tired of us?

Mr. WALLACE. John is not feeling too well and had an operation and could not be here today.

Senator GRAVEL. Please convey to him my personal regard and wishes of good health for the good work he has provided us in the past.

Mr. WALLACE. I will do that.

In our joint testimony, we will review the results of our preliminary analysis of the administration's recent crude oil price deregulation and windfall tax profits proposal.

Senator CHAFEE. Mr. Chairman, I think these are very good statements and certainly have a lot of meat in them. I wonder how you intended to proceed, if Mr. Wallace—he has a 35-page statement here. How do you figure we are going to—

Mr. WALLACE. I have a summary which will bring my talk down to a maximum of 20 minutes.

Senator CHAFEE. All right.

These are excellent. Obviously a lot of work has gone into them, and I was just wondering mechanically how we were going to handle it.

Senator GRAVEL. If we could get all the statements in, then I think it would give us a good grasp of the totality and then individuals could focus on the areas of interest that we have. Otherwise, we could spend a lot of time questioning one witness and lose the full benefits of the other witnesses.

I would like to get all of the servings on the plate before we choose individually what we want to query about. Fair enough?

Senator CHAFEE. Fair enough.

Mr. WALLACE. Today, we will summarize our lengthy written testimony.

The following issues will be addressed:

First, the adverse consequences of the increasing U.S. dependence on imported oil, and the relationship of U.S. energy policy options to the magnitude of oil imports.

Second, due to the Salomon Brothers presentation I will skip over the U.S. petroleum industry profits and investment activities and emphasize the role that decreased incentive prices and increased internal cash flow might play in decreasing U.S. oil imports and the extent to which the administration's windfall profits taxes might serve to limit the degree of import reduction which could result from oil price decontrol. We hope our remarks will be of some assistance to the subcommittee in its present inquiry.

The current worldwide shortage of oil and associated escalation in OPEC oil prices is again driving home the consequences of growing U.S. dependence on imported oil. Since 1973, as a result of increases in both the volume and real prices of OPEC oil, the U.S. oil import bill has increased fivefold. The economic impacts of rising oil import costs have been huge.

To pay for these imports, the United States has had to give up more and more of its currently produced goods and services, together with assets produced in previous years. As a result, since 1973 the standard of living of the average American has shown little, if any, real improvement. Comparatively, it is fair to say we have lost ground.

Nor can any relief be expected over the near term, since the partial return of Iranian exports has been accompanied by purposeful decreases in production by several other OPEC nations. Furthermore, over the longer term, many oil exporting nations seem likely to become even more conservative with respect to their future oil production and economic development plans; at least this is the prudent assumption to make in formulating U.S. energy policy.

Thus, the United States must make every effort in the short and intermediate term to decrease its dependency on OPEC resources. Every possible effort must be made to accelerate the thrust toward increased self-sufficiency. Nothing less than our national security is at stake.

However, over the near term, major reductions in oil imports will have to come from conservation and from increased domestic oil and gas production. All major forecasters estimate that only minor import savings can be expected from decreases in oil consumption due to conservation, even with the phased decontrol of oil prices to consumers.

In particular, rising gasoline prices will have relatively little effect on gasoline consumption by new car additions to the fleet. This is because of the extremely stringent fuel economy standards now in place. For example, these standards will fully offset the impact of new car fuel costs of the first 37 percent of any real gasoline price increase between now and 1983.

Further, on the supply side of the liquid fuels balance, even with the sharply higher oil and gas prices, little can be expected over the near term from increased production of syn-fuels and shale oil due to the time which will be needed to bring such production on line. Fortunately, there appears to be the potential for relatively large increases in domestic oil and gas production and proven reserve creation.

Given the magnitude of the energy problems facing the Nation, we feel it is imperative that a massive effort be made to accomplish this potential. Increases in oil production will serve to immediately offset oil imports, while expansion of proven oil reserves will insure that increased production will be maintained as well as provide the most effective "strategic petroleum reserve." Indeed, such an effort is the best protection against what many, including DOE, fear—namely that another round of dramatic OPEC price increases could occur in the mid- or late 1980's.

Obviously, this urgently needed effort to increase domestic oil production and reserve creation will require vastly expanded investment and drilling activities by the U.S. oil industry.

In this regard, we feel it is unfortunate that a number of Government officials have chosen to attack the motives of the oil companies rather than requesting their support in a mutual effort designed to alleviate this critical national problem. Indeed, it is imperative that the American public gain a full understanding of the nature of the problem that confronts us. Inflammatory rhetoric serves no useful purpose.

Time is short. Let us not waste it in pointing fingers. Instead, we must make very effort to insure that we devote our energies—indeed, our national will—to solving this country's energy problem.

In this regard, President Carter's decision to decontrol crude oil prices in a phased fashion obviously took considerable political courage. It was a decision long overdue. For some time, it has been generally recognized that the continuation of price controls on crude oil was counterproductive to expansion of domestic oil supplies. Admittedly, this decision will result in short-term disruptions in the marketplace. As a result, some will criticize his decision.

For the long term, however, this decision was imperative and we can only add another opinion that endorses President Carter for both beginning the decontrol process and for his wisdom in phasing the decontrol process so as to insure that the inflationary impact will be spread out over time.

On the cost side of the ledger, we estimate that the decontrol measures will raise the 1979 inflation rate by 0.1 percentage points in 1979 by 0.3 percentage points in 1980 and another 0.3 percentage points in 1981. By the end of 1981, petroleum product prices will increase approximately 6 cents per gallon due to decontrol. Over the short term, these inflationary impacts will serve to slow economic activity and increase unemployment, although the magnitude of these impacts will be minor. It is worth emphasizing that all major forecasters agree that the economic impacts of phased decontrol will be near-term and minor.

On the other hand, large long-term benefits will result from decontrol. Both the quantity and the cost of oil imports will be lowered relative to what they would be under continued controls. As a result, the U.S. oil import bill will decline, the value of the dollar will increase, and the average price the United States pays for all imported goods and services will decline. These price declines of nonoil imports will initially help to offset the direct inflationary impacts of decontrol, and, unlike the direct inflationary impacts, will continue to increase in magnitude over time, so that by the mid-1980's or earlier, the general level of prices as measured by the CPI will be lower under decontrol than under continued controls.

Further, domestic productivity will also increase as we reallocate resources toward the production of greater amounts of cheaper domestic oil and oil substitutes and away from the production of goods and services for export, which in the absence of decontrol would have been required to pay for additional oil imports. As import prices drop and as productivity improves, economic growth will accelerate and standards of living will rise.

Unfortunately, these benefits will be relatively slow in coming due to the time needed to replace current energy-inefficient plant and equipment, and also the time needed to bring on line greater amounts of production of domestic oil and oil substitutes. Even by 1985, however, the net benefits will be substantial.

As Charles Schultze mentioned in his congressional testimony, there is probably no other single action the United States could take that by 1985 would produce as great an amount of oil import savings.

The President has proposed that phased oil price decontrol be accompanied by a windfall profits tax. The windfall profits tax, in turn, incorporates two separate taxes, an "OPEC tax" and a "decontrol tax."

Under the "OPEC tax," all newly discovered oil—and after October 1, 1981, upper tier oil as well—would be taxed to the extent that OPEC price increases exceed the U.S. rate of inflation. As proposed, the OPEC tax would be permanent. Obviously, such a tax limits the future price incentive for finding new oil.

In addition, the "decontrol tax" portion of the windfall tax involves a tax on the bulk of oil obtained from currently producing oil wells, thus reducing the cash flow that otherwise would be obtained by the industry. As will be indicated shortly, internal cash flow is a particularly important determinant of future exploratory efforts in the crude oil and gas industry.

The windfall profits tax proposal is being justified by the administration primarily on the basis that oil industry profits are in some sense too large and the oil industry revenues will rise with each new OPEC price increase.

While profits are commonly viewed as a source of business income, and as such are often viewed with suspicion when they become large, it is much less widely appreciated that the level of profits and profit differentials among industries, and companies within an industry also serve as important mechanisms for achieving the reallocation of resources necessary to promote economic growth.

As long as investors are free to allocate capital where they wish, they will allocate it to those industries where they expect to gain the highest return; that is, to make the most profit. Thus, an industry which is expected to be more profitable is likely to draw capital away from less profitable industries.

Moreover, as more capital is applied to one industry relative to others, supply in that industry increases and prices fall relative to prices elsewhere. That is, relative profits serve as a signalling mechanism for increasing production in high profit industries and decreasing production in low profit industries. Taxation of excess profits or regulation of prices is only warranted in those situations where free entry is not possible.

Sadly, these facts are not widely recognized. Instead, "excess" profits, that is, higher than normal or average profits, are viewed as "immoral" or "obscene" even if they are derived in a perfectly competitive way.

Unfortunately, there seems to be a persistent belief on the part of the administration, and the public for that matter, that the petroleum industry is extraordinarily profitable and that price controls are needed to keep oil industry profits within reasonable bounds. This belief is not supported by the facts.

Regardless of whether one uses traditional accounting measurements of return, such as return on equity, assets or sales, or measures of return based on discounted cash flow concepts or stock market performance, there is no evidence that the oil industry taken as a whole has had above average profitability, let alone excessive profits. Let us review some of the evidence.

Shown in figure 1 is the average return on equity for 27 large oil companies in their U.S. operations as compared to the average return obtained by all U.S. manufacturing companies.

Until 1974, the return on equity in the oil industry was generally below that for all manufacturing. Then as a result of the rapid 1973-74 runup in OPEC oil prices, the rate of return in the U.S. oil industry accelerated in comparison to the rate obtained in all manufacturing.

In the 1975-76 period, the return was higher in the oil industry.

However, by 1977, the differential had disappeared and by 1978 reversed. This comparison highlights the important fact that, on average, oil industry profits are comparable to those of other industries. Furthermore, there is no indication that monopoly profits have been made by the oil industry, even when several alternative measures of profit are employed.

Now let us look at the relation between oil company profits and oil company investments shown in figure 2 for a group of 27 of the largest oil companies from whom we collect financial data. Although it is more meaningful to analyze all sources of investment funds, not just profits, for the moment we have chosen to highlight profits and capital expenditures because that is where the public debate seems focused. Note that, in all years, the group's capital expenditure exceeds its net income. Moreover, between 1973 and 1976, when aggregate U.S. petroleum profits expanded rapidly, investment expenditures increased even more rapidly than profits in both absolute and percentage terms. Since 1976, however, as the profit differential between oil and other industries narrowed, and as the rate of growth of aggregate petroleum profits sharply declined, investment has leveled off. Obviously, increased uncertainty over future energy policy and higher costs of capital have also played a role here.

Now let us consider how oil companies have been allocating their increased investment expenditures. As table 1 indicates, capital spending in the 1973-77 period was much more oriented toward production and transportation than in the previous 5-year period. Moreover, since 1973, the bulk of the transportation investments involved the movement of crude oil from the producing areas. The expenditures for production and transportation purposes together, therefore, grew from nearly 57 percent of the total investments in the 1968-72 period to over 69 percent in the 1973-77 period.

Recently, a great deal of attention has been focused on the magnitude of oil company investments outside the oil and gas industry. Our analysis of capital expenditures leads us to believe that the magnitude of capital expenditures outside the industry is extremely small in comparison to total expenditures made within the oil industry. That is, in table 1, it can be noted that the share of capital expenditures going to "other"—which includes nonoil energy investments as a subsegment—has held constant at 5 to 6 percent of total expenditures.

While it is true that an acquisition of a company's stock is not reported as a capital expenditure, examination of SEC form 10K's over the last 5 years indicates the major noncapital expenditure acquisitions have been the well-publicized Mobil acquisition of Marcor, ARCO's acquisition of Anaconda and SoCal's acquisition of 20 percent of AMAX.

However, all in all, our analysis suggests such acquisitions represent a small fraction of the amount of funds that these firms reinvested in

the oil business and that, on an industry basis, the outside investment has been all but negligible.

In summary, the hard dollar data totally refute the notion that major oil companies are neglecting their longstanding commitments to the U.S. petroleum industry and are diverting significant financial resources to other lines of business. In fact, the industry is devoting a greater share of its total investment expenditures to crude oil exploration and production activities, including drilling. As shown in figure 3, since 1973, drilling activity has increased at a rapid rate.

It must be commented here that unfortunately, thus far in 1979, drilling activity has declined by over 20 percent from December 1978 levels due predominantly to uncertainty surrounding Government regulatory--natural gas--and oil policy actions. Given the extremely serious nature of the U.S. energy problem, this governmentally induced decline in U.S. drilling activity is a blatant indication of the failure of U.S. energy policy to date.

The question now arises as to whether the U.S. oil industry is different from any other industry in the United States; that is, whether larger than normal profits can serve the same function in the oil industry as elsewhere in signaling the need for resource reallocation and in providing at least a portion of the required investment funds. Several arguments have been put forth to the effect that petroleum profits are different. Each is considered in turn.

The first argument is that windfall oil industry profits exist due to the OPEC cartel. It is often alleged that the domestic oil industry is not entitled to the increased profits that would result from permitting domestic prices to rise to OPEC cartel levels; that is, the prices resulting from decontrol.

Senator GRAVEL. Repeat that again.

Mr. WALLACE. However, from the vantage point of the United States, it is irrelevant whether the world oil price is a monopoly-set price. This follows from the fact that the U.S. oil import bill represents the actual value of resources which the United States must give up through increased exports of goods and services or assets (capital flows) to obtain additional barrels of imported oil. Hence, the real dollar opportunity cost of all domestic oil production, old or new crude, is the OPEC price.

Let us see why the current controls on domestic oil prices are detrimental to U.S. standards of living. It can be shown that in order to obtain the most efficient use of our scarce capital and labor resources, domestic oil should be priced at OPEC levels despite the fact that OPEC is a cartel. The reasoning is that, under the current crude oil price control system, for every barrel of oil the United States imports at the current U.S. landed price of \$18.25 per barrel, the United States must give up domestic resources also valued at \$18.25 per barrel. However, currently domestic oil producers receive only \$13 for a barrel of new, or upper tier, oil.

As a result, the United States is expending more resources to pay for an imported barrel of oil than it is expending to produce a barrel of domestic oil. As a consequence, the United States is not producing these quantities of oil which could be produced with fewer resources that we use for producing exports to pay for imported oil; namely, all that oil which could be found and produced at costs ranging from \$13 per barrel to \$18.25 per barrel.



For every additional barrel of domestic oil we produce costing less than \$18.25 per barrel, we obtain a net resource savings, which is then used for producing additional goods and services for consumption here in the United States. The point is that, if the price of oil received by domestic oil producers is permitted to rise to the world level, we could get more oil for the resources used at home and reap increased real income in the bargain.

This is not to say that the OPEC cartel is not important with respect to determination of domestic crude oil profits. In an uncontrolled domestic crude oil market, increases in world oil prices will bring corresponding increases in domestic oil prices and profits will increase. But this increase in domestic profits is desirable in that it will serve as the signal or incentive for further expanding domestic oil production until the costs of additional oil just match the new higher OPEC prices. That is, initial increases in profits are required to bring about the desired adjustment process, just as in any other industry.

Senator CHAFEE. Could we discuss this briefly?

Senator GRAVEL. Yes. Let's run that one by one more time.

Senator CHAFEE. Let me see if I follow it. I get your point. If we are buying oil for \$18.25 abroad, we are having to produce goods and services worth \$18.25, and we export those in order to get this barrel.

Mr. WALLACE. If we do not do that, we run the deficits we have been running and the dollar declines, raising import prices and soon.

Senator CHAFEE. Do not get me too far afield now. I am following what you say here. We export goods and services to pay for that. All right.

Now you are saying that if we pay domestic producers less than \$18.25, then we are not having to produce as many goods and services to get that barrel of oil. That is your second point. That is true.

Suppose, the domestic price rises to the OPEC price, \$18.25. Then how are we ahead of the game?

Mr. WALLACE. Because producers will seek to produce all the oil that can be efficiently produced up to that price, reaping income in the process which will be spent in numerous ways, but which will come back into the system in this country, not dollars outside of this country.

Senator GRAVEL. Are they buying the product at a cut rate?

Mr. WALLACE. No. You really have to think of the resources that are being expended here in terms of capital and labor, and the fact that what we are saying is that additional oil will be produced from the current price of \$13 to the last marginal barrel at \$18. Obviously, on some of the oil that costs less, profits and cash flow will be generated which will then be plowed back into further exploration activities and so on, but those dollars stay in this country. Fifty percent of the profits go back into Government and into the system. The dollars do not go out.

Senator GRAVEL. Dr Forrester.

Mr. FORRESTER. I was just going to say that I think the point we make here is a great deal stronger than it has been stated, because even at equal prices, the revenue and those goods and services are coming back to Americans who have to be supported, in any case. It is a question of whether we pay our own people for even the equal price of oil, or whether we support other societies with it.

Mr. WALLACE. Furthermore, we have not built in the externalities of the national security implications of all of this. It is basically a trade theory argument.

Senator GRAVEL. That we subsidize foreign oil.

Senator BAUCUS. Do you know the profit margin that American oil companies get on foreign oil compared to domestic oil; if the domestic price were the upper tier market level, is there a difference in the margin on moneys received?

The oil companies now buy OPEC oil, for example. Assuming they were to get the same market price for domestically produced oil, the assumption is that there would be a greater profit margin on the investor-produced oil than higher prices to purchase OPEC oil. Is that correct?

Mr. WALLACE. That is true. It depends on which oil we are talking about. Are we talking about oil in the ground? Are we talking about stripper oil, tertiary? Every barrel, there will be a difference.

Senator BAUCUS. I understand that. I am talking about costs to produce new oil. I assume you can get the market price, \$18.25. I am wondering.

Mr. WALLACE. The best way I can answer your question, as Solomon Bros. indicated earlier, it is very difficult to estimate the true cost of finding oil. It is our feeling, however, that allowing domestic producers to receive current OPEC prices certainly cannot be construed as an extraordinarily high incentive price. If anything, it may not be high enough.

Speaking personally, one could argue—this is not a bank position; personally, if you did not have to worry about the retaliations by the Saudis and OPEC in return, one could easily argue for a tariff to actually further increase reserve creation potential.

Senator BAUCUS. I understand the point you are making here. The American economy is healthier if oil were produced here. But it seems to me if the profit margin is greater in domestic produced oil, even though the domestic price the domestic producers get for domestically produced oil is not as high as the OPEC price, if the margin, the rate of return, is much greater in domestically produced oil, it may be an offsetting factor.

Mr. WALLACE. I agree. That has to be addressed in two ways. You have to look at incentive prices—is their level appropriate?—and just as important, the cash flow indications. Does the industry have adequate cash flow, for example, to continue production levels and replace reserves?

If you allow me, I am going to cover both of those issues, because the appropriate answers to your question is that both incentive prices and cash flow are affecting our production and reserve position, and we will go on to discuss both.

Senator BAUCUS. One very quick question. You say domestic oil should be priced at OPEC levels, despite the fact that OPEC is a cartel. Could you analyze that further?

What if OPEC prices are doubled?

Mr. WALLACE. That is a very important point. Some sort of smoothing might, in fact, be worth considering. In other words, it might be reasonable to look at some sort of smoothing when you are looking at a fourfold increase. In terms of a smooth increase in real prices, basically the prospect that most major energy forecasters have now, the argument follows.

Senator GRAVEL. I would like to press on.

Mr. WALLACE. Let me go on to the next argument, on page 20.

The next argument often used to justify the windfall profits tax proposal is that excess oil industry profits exist since crude oil is an exhaustible resource. It is true that the oil industry differs from many industries in that additional oil production cannot be obtained at constant costs. Since cheaper oil deposits tend to be found first, additional oil can only be produced at higher costs—in the absence of technological improvements in discovery and production techniques.

As a result, over time, the real price of oil will increase relative to the prices of other goods and services. This is a consequence of the fact that oil supplies of a given quality and in a specific location are finite in nature. This unfortunate fact of nature does not invalidate the role of profits as an incentive mechanism for encouraging greater production of the lower cost domestic oil to replace imported oil as its real price rises, once again even if due to a foreign cartel.

Supporters of the windfall profits tax also allege that increases in OPEC prices bring unearned windfall profits on currently produced domestic oil. While many oil industry critics grant that prices for new oil should increase with increases in the price of OPEC oil so as to assure more domestic production of new oil, they argue that the price of old oil currently in production should not receive OPEC prices. However, controls on old oil prices will limit the degree of expansion in new oil production for a number of reasons.

First, the rate of oil extraction from proven oil reserves, while subject to technological constraints, can be increased as the price received for the oil being produced rises. In particular as the price of old oil rises, more expensive recovery techniques become economical and more old oil is produced. In general, as old oil prices increase, both annual production rates and the total cumulative amount recovered will increase.

Second, any limitations on old oil prices will affect producers expectations as to the future prices to be received for new oil. That is, if the Government puts price controls on old oil, the expectation will naturally arise that such controls will at some point be applied to new oil. As a result, when price controls are applied to old oil, producers will mark down their expectations as to the profitability of new oil, and exploration activities will consequently be cut back.

Finally, price controls on old oil, by limiting profits, will limit the amount of funds available for financing additional exploration for new oil deposits.

In short, price controls on old crude adversely affect both cash flow and expectations as to future incentive prices and therefore negatively impact exploratory activity and oil and gas production.

As mentioned previously, the proposed windfall profits tax will reduce both future price incentives and current cash flow. Now let us quantify the detrimental effects which dampened price incentives and lowered cash flow can be expected to have on exploration and development expenditures and therefore on future oil production.

First, we consider the role of price incentives and then the independent importance of cash flow in determining exploration and development activity.

The most damaging aspect of the windfall profits tax proposal is the so-called OPEC tax on new oil, because of the depressing effect it has on price expectations, as well as cash flow and the expected value of finding new domestic oil reserves and therefore on future oil production. In evaluating the OPEC tax proposal, it is crucial to note that:

First, every American producer is alert to the possibility of further OPEC price increases and plans future exploration accordingly.

Second, capital gains on inventories of exhaustible resource reserves are not extraordinary and unexpected; rather, they are an inevitable feature of the transition to more expensive energy resources, with or without OPEC.

Third, the importance of inventory gains in supporting development of a broader resource base is especially important in the oil business where the technology of reservoir dynamics requires 7 to 10 years production in working inventory.

And fourth, increasing values of American oil resources, caused in this case by increasing OPEC prices, if passed on to American producers, will enable U.S. producers to search for and hold more expensive proven reserves in productive inventory. With rising reserve values, oil exploration efforts will buy ahead just as consumers are currently buying homes and autos in anticipation of further inflation.

Charles L. Schultze, Chairman of the Council of Economic Advisers, in his April 5, 1979, testimony before the Joint Economic Committee's Subcommittee on Energy, stated that: "Incredibly, under the current control system, we pay OPEC more for oil than we are willing to pay Americans who produce oil substitutes." He should have gone on to add that under current controls, we also pay American oil producers less for their oil than we pay OPEC for theirs, and further that, with the OPEC tax, we would permanently continue this counterproductive policy.

Recall that the OPEC tax is in fact a permanent excise tax on American oil producers of one-half of the increased value of their oil induced by OPEC price increases. This tax reduces the value of finding a new barrel of domestic reserves to producers, and reduces it more sharply the higher the rate of OPEC price increase.

In this context, this is a puzzling tax proposal. The administration has courageously advocated consumer price deregulation, permitting the consumer to face the true opportunity cost for oil—namely, what we must pay OPEC for it. This induces economic conservation. Further, it confronts OPEC with consumers' responses to price increases, thus dampening the monopoly profits accruing to OPEC that future OPEC price increases might reap.

Symmetrically, deregulated producers' prices would support economic development and production of new oil to supplant OPEC imports and confront OPEC sellers with effective competition from American producers.

However, by imposing a tax wedge between the market price and the American producers' price, the OPEC tax in effect permanently continues domestic producer price controls, with the severity of the tax increasing as the rate of OPEC prices increase.

In summary, this OPEC tax would:

Lower exploration and new production incentives.

Increase the imports of OPEC oil which could be replaced cost effectively by American production—without the adverse balance of payments, exchange rate, employment, investment, and national security impacts which arise from added oil imports.

Encourage greater OPEC pricing aggressiveness because the negative impacts of the OPEC tax increase over time and are magnified by increasing OPEC prices. This greater aggressiveness, in turn, will amplify the other detrimental effects.

The administration's analysis of the impact of the OPEC tax is deficient in that it has not even presented a systematic analysis of changes in the magnitude of the OPEC tax as a function of rising OPEC prices, let alone an analysis of the impacts of such high taxes on the expected value of new reserves and, therefore, future production.

To analyze these effects, Chase is developing a detailed long-term analysis of OPEC tax revenues and reserve values under alternative OPEC price scenarios.

The results of our preliminary analysis indicate that given an average annual growth rate of 2.5 percent per year in real OPEC prices, by 1990 the imposition of the OPEC tax will decrease the value of reserves by 22 percent from the value which can be expected in the absence of the tax.

Given a 5-percent per year rate of increase in real OPEC prices, the value of reserves will decline by 29 percent in 1990 as a result of the tax. These 22 percent and 29 percent reductions in reserve values by 1990 caused by the OPEC tax, in turn, would lead to 1990 production declines of at least 800,000 barrels per day and 1 million barrels per day, respectively. A detailed technical report on this analysis will be available shortly.

Finally, while we oppose the concept of the OPEC tax proposal, we also strongly oppose the \$16 per barrel base price proposed by the administration for the fourth quarter of 1979 to be used in calculating the proposed OPEC tax. On April 1, 1979, the average landed price of all U.S. crude oil imports had already reached \$18.10 per barrel and we expect that the price will increase to over \$19 per barrel by the fourth quarter of 1979.

Thus, the administration is not only proposing that all future post-fourth quarter 1979 real price increases for new oil be cut in half, forever, but they are also proposing a startup tax of over \$1.70 per barrel for every new barrel of oil for as long as it is produced.

Further, in estimating the tax burdens on the domestic oil industry as a consequence of the windfall profits tax, the administration in its April 1979 release neglected to mention the magnitude of the very large tax burdens which would result from the OPEC tax, including the initial and permanent \$1.70 per barrel tax.

This initial \$1.70 per barrel tax alone will cost the industry increasingly large sums over time, so that by 1985, the annual OPEC tax losses will be \$5.3 billion, while the cumulative 1980-85 OPEC tax loss will be \$22.8 billion, assuming constant real OPEC prices. If OPEC prices rise at 5 percent per year in real terms, the cumulative OPEC tax loss would swell to \$61 billion over the 1980-85 period.

Clearly, the OPEC tax portion dominates the decontrol portion of the proposed windfall profits tax. By 1985, as the administration has indicated, the decontrol tax burden on the industry would be a relatively small \$1.6 billion. However, the administration neglected to

mention the 1985 OPEC tax burden of \$5.3 billion, assuming constant real OPEC prices.

Assuming a 5-percent per annum real growth in OPEC prices to 1985, by 1985 the decontrol tax portion remains at \$1.6 billion but the OPEC tax becomes \$18.7 billion.

Let's consider next the cash flow impacts of windfall profits taxes of this magnitude. As we have just shown, besides limiting the magnitude of future real price increases, the OPEC tax portion of the proposed windfall profits tax will also adversely affect the future cash flow of the oil and gas industry.

In a recent publication we stressed the importance of cash flow as a determinant of capital expenditures, particularly for exploratory drilling. Let us first summarize our position, and then respond briefly to a recent study financed by the Department of Energy which criticizes our position.

Crude oil and gas exploratory projects are subject to extremely high risks. Only 10 percent of all rank wildcatting projects yield any revenue, and of these, only a quarter yield enough to recover costs. As a result, commercial lending institutions will simply not lend funds for exploratory drilling efforts unless the borrower is certain to obtain a continuing cash flow from production from existing reserves.

Even in this case, it is usually not prudent to use debt financing. The rationale is straightforward. Suppose the borrower uses up all the borrowed funds but experiences only a run of dry holes, so that his new debt expenses then just cover his after-tax cash flow obtained from production from existing reserves. At this point, further drilling cannot be financed; and, what is worse, his after-tax cash from production from existing reserves is reduced by the loss of current year write-offs previously obtained from drilling dry holes.

The company is then unable to cover interest, debt repayment and the now higher Federal income taxes. This problem has occurred in cycles in the past but always with the same result—increased oil industry concentration.

Since debt financing is generally not available for exploratory projects, these operations are normally financed by either internal cash flow or equity capital. Further, the availability and cost of equity capital depends on a company's track record with regard to internal cash flow and net revenue.

However, in the past few decades, several nontraditional techniques were developed in an attempt to secure additional sources of financing—these include drilling funds, farmouts, and ABC payments.

#### DRILLING FUNDS

In the 1960's, drilling funds were at their peak and in aggregate raised somewhat over a billion dollars per year publicly and perhaps a similar amount privately. The drilling funds history was one of successes, large failures and frauds. Today, as a result of recent changes in the depletion law and in the tax treatment of individuals, the role of drilling funds is much more limited than in the past. In 1977, approximately \$500 million was raised publicly by drilling funds, a rather small sum versus the tens of billions the industry needs.

## FARMOUTS

Farmouts are a trading of an interest in exploratory acreage for the assumption by another party of the obligation to drill. Unfortunately, the most popular farmout arrangement used by domestic firms for exploration was recently ruled against by the IRS, so that the importance of this financial mechanism is also on the wane.

## ABC PAYMENT

It has been estimated that between the mid-1950's and the mid-1960's, \$3 billion of property acquisitions were financed through the ABC payment technique before the IRS removed the tax advantages accruing to it, and, in effect, terminated its usage.

This brief discussion was not intended to be an exhaustive one on exploratory activity financing, but merely to put the amount of funds available from nonconventional debt and equity sources into proper perspective. As we will see, such funds are extremely small when compared to the drilling effort required over the 1978-85 period.

The seemingly obvious implication of this lack of alternative sources of funding for exploratory activity is that changes in cash flow affect exploratory drilling activity and that increased taxes which reduce cash flow obtained from production from existing reserves can easily deprive the Nation of sorely needed incremental exploratory investment activity.

In addition, such taxes could quite possibly lead to increased concentration in the oil and gas industry.

These conclusions, though disputed by the administration, seem clear to us and, of course, to the industry itself. In a recent study financed by DOE, it was claimed that so long as the expected return on investment for any project exceeds the cost of capital, the project will be undertaken, regardless of the company's cash flow outlook from current activities.

This conclusion was reached not by addressing the issues just discussed; namely, the reluctance of commercial institutions to lend funds for use in financing exploratory drilling projects. Nor did the study cite the results of consultations with petroleum industry financial people.

Instead, the study cited the theories developed by academics, designed to handle a "typical firm." For many reasons, namely, the extremely risky nature of petroleum exploration, the large percentage of up-front funds required for such investments and the importance of writeoff expensing, it is clear that the financing arrangements for exploratory drilling projects are far different from the financing arrangements for a "typical firm."

The DOE-sponsored study also attempted to empirically measure the relative importance which cash flow played over the 1973-77 period in financing crude oil exploration and development expenditures for 25 independent E. & P. firms. While the study claims that its results suggest that cash flow is not important, we find that the simple correlation of 0.61 (1.0 indicates a perfect correlation) found in the study between changes in cash flow and changes in investment expenditures to be remarkably large. This is particularly true given the following limitations for the study:

First, practical financial considerations suggest that cash flow particularly affects exploration projects. The study aggregated exploratory investment with development investment.

Second, the theory of investment being developed at the Chase implies that changes in incentive prices, in Government regulatory definitions and procedures, and in Government leasing policies also affect investment expenditures in addition to changes in cash flow by varying both the number of potential projects available and the expected ROI on each project. The study does not control for these other determinants of exploratory activity, which invalidates their results from a statistical viewpoint.

Finally, ICF does not account for interaction between changes in cash flow and changes in equity financing. In particular, as previously mentioned, increases in cash flow, besides serving as an increased direct source of investment funds, also permits firms to obtain greater amounts of equity financing at lower rates. These indirect multiplier effects associated with increases in cash flow are also excluded from the DOE-sponsored study.

Since changes in cash flow affect investment levels, the decontrol tax portion of the administration's program, by limiting the cash flow available from production from existing reserves and the OPEC tax by limiting cash flow from future reserves, should be expected to reduce future investment and drilling activity.

The obvious question that must be addressed next is whether or not the domestic oil and gas industry's cash flow is "adequate" to meet our Nation's energy requirements. In our view, the adequacy of cash flow must entail specific assumptions regarding the rate of proven reserve depletion. Given the magnitude of domestic oil and gas resources still in the ground, we define as adequate cash flow that level which will permit the funding of drilling activities sufficient, at least, to replace proven reserves at current production levels. Needless to say, we feel that it is in the national interest that both incentive prices and cash flow be more than adequate, so that domestic oil and gas production can efficiently displace imported oil.

We have just completed the first phases of a detailed cash flow analysis similar to that which we did regarding COET. The findings are now equally dramatic. With the proposed windfall profits tax in place, we would argue that it will be all but impossible for the domestic oil and gas industry to achieve even the relatively modest production levels forecast by DOE without a needless and extremely risky further runoff in our Nation's proven reserves.

Reserve replacement will require a cumulative capital expenditure in the \$350 to \$400 billion range over the 1979-85 period. With the windfall profits tax in place, the industry would have to raise nearly \$100 billion in outside capital, an impossible task. Depending on the rate of increase of OPEC prices, the proposed windfall profits tax will have siphoned off some \$20 to \$40 billion of the required funding.

In our view, this tax is not in the national interest.

The major difference between our view as to the adequacy of the oil industry's cash flow as compared to DOE's view is that we feel that proven reserve replacement is not only possible over the period but absolutely essential. In particular, proven reserve replacement will help avoid a future even more rapid decline in domestic oil production,



which, in turn, would further accelerate the recent deterioration in our standard of living and national security.

The above analysis strongly suggests that the windfall profits tax, and particularly the OPEC tax, will drastically limit future investment in domestic oil and gas exploration and development activities and, as a result, we do not view the tax as an appropriate energy policy option. Nevertheless, we recognize that legitimate equity concerns are raised by the decontrol of oil prices.

However, to us, the real equity issue is not oil industry profits but rather what should be done to compensate the lower income households in general and particularly those lower income households that are currently locked into a high energy consumption lifestyle.

Such people will be hurt by decontrol and compensatory measures seem to be in order. But, we feel such compensation should not be tied to oil company revenues, nor should it take the form of price controls; rather, the compensation should come via the income tax system through appropriately defined energy-related income tax credits or deductions.

In conclusion, I would like to restate the themes interwoven throughout my testimony.

First, compared to profits in other industries, profits in the domestic oil and gas industry have not been excessive.

Second, in periods when domestic petroleum profits have increased rapidly both in absolute terms and in relation to profits in other industries, domestic drilling activity has increased.

Third, the primary objective of U.S. energy policy should be to decrease our dependence on oil imports. Further, this objective can most efficiently be achieved by providing greater price incentives and cash flow to domestic oil and gas companies via phased decontrol of crude oil price.

Fourth, by limiting price incentives and cash flow, the windfall profits tax will blunt much of the positive import reduction effects which will result from phased price decontrol. By just reducing the incentive prices—as distinguished from its effect on cash flow—the OPEC tax's impact on the value of finding new reserves could easily increase oil imports by over 1 million barrels a day by 1990. The cash flow impact of the windfall profits tax on domestic production could be expected to lead to an additional oil import increase of over 1 million barrels a day by 1985, with further increases by 1990 even assuming moderate post-1985 OPEC real price increases.

Fifth, it should be noted that the proposed windfall profits tax will serve to depress domestic production, thereby aggravating the long-term inflationary impact.

Finally, the real equity issue associated with decontrol does not concern the magnitude of oil industry profits, but rather the effects of higher energy prices on lower income consumers. However, these issues are far more effectively handled by the income tax system rather than by continued controls or by decontrol coupled with the proposed windfall profits tax.

Needless to say, I will be pleased to try to answer any questions you may have concerning my testimony.

Senator GRAVEL. Thank you.

[The prepared statement of Mr. Wallace follows:]

**JOINT STATEMENT OF JAMES P. WALLACE III, VICE PRESIDENT; AND HAROLD D. HAMMAR, VICE PRESIDENT, THE CHASE MANHATTAN BANK**

Mr. Chairman and members of the Subcommittee, I am James P. Wallace III, Vice President and Division Executive of the Energy Economics and Automotive Division of The Chase Manhattan Bank, and with me today is Harold Hammar, Vice President and Division Executive of the Chase's Petroleum Division.

In our joint testimony today, we will review the results of our preliminary analysis of the Administration's recent crude oil price deregulation and windfall profits tax proposal. The following issues will be addressed:

First, the adverse consequences of the increasing U.S. dependence on imported oil and the relationship of U.S. energy policy options to the magnitude of oil imports,

Second, a brief review of recent U.S. petroleum industry profits and investment activities;

Third, the role that increased incentive prices and increased internal cash flow might play in decreasing U.S. oil imports; and

Fourth, the extent to which the Administration's windfall profits tax might serve to limit the degree of import reduction which could result from oil price decontrol.

We hope our remarks will be of some assistance to the Subcommittee in its present inquiry.

**INTRODUCTION**

The current worldwide shortage of oil and associated escalation in OPEC oil prices is again driving home the consequences of growing U.S. dependence on imported oil. Since 1973, as a result of increases in both the volume and real prices of OPEC oil, the U.S. oil import bill has increased fivefold. The economic impacts of rising oil import costs have been huge. To pay for these imports, the United States has had to give up more and more of its currently produced goods and services, together with assets produced in previous years. As a result, since 1973 the standard of living of the average American has shown little, if any real improvement. Comparatively, it is fair to say we have lost ground.

Nor can any relief be expected over the near term, since the partial return of Iranian exports has been accompanied by purposeful decreases in production by several other OPEC nations. Furthermore, over the longer term, many oil exporting nations seem likely to become even more conservative with respect to their future oil production and economic development plans; at least this is the prudent assumption to make in formulating U.S. energy policy.

Briefly, we must make every effort in the short and intermediate term to decrease our dependency on OPEC resources. Every possible effort must be made to accelerate the thrust toward increased self-sufficiency. Nothing less than our national security is at stake.

Over the near term, major reductions in oil imports will have to come from conservation and from increased domestic oil and gas production. However, all major forecasters estimate that only minor import savings can be expected from decreases in oil consumption due to conservation, even with the phased decontrol of oil prices to consumers.<sup>1</sup> In particular, rising gasoline prices will have relatively little effect on gasoline consumption by new car additions to the fleet. This is because of the extremely stringent fuel economy standards now in place. For example, these standards will fully offset the impact of new car fuel costs of the first 37 percent on any real gasoline price increase between now and 1983.

Further, on the supply side of the liquid fuels balance, even with sharply higher oil and gas prices, little can be expected over the near term from increased production of syn-fuels and shale oil due to the time which will be needed to bring such production on line. Fortunately, there appears to be the potential for relatively large increases in domestic oil and gas production and proven reserve creation.<sup>2</sup>

<sup>1</sup> The Department of Energy estimates a 400,000 b/d reduction by 1985 from the demand response to higher decontrolled prices.

<sup>2</sup> This assessment was also reached in a recent study carried out by ICF, Incorporated for the Department of Energy entitled, "Capital Resources and Requirements for the Petroleum Industry Under the National Energy Plan," January 1979.

Given the magnitude of the energy problems facing the nation, we feel it is imperative that a massive effort be made to accomplish this potential. Increases in oil production will serve to immediately offset oil imports, while expansion of proven oil reserves will insure that increased production will be maintained as well as providing the most effective "strategic petroleum reserve." Indeed, such an effort is the best protection against what many, including DOE, fear—namely that another round of dramatic OPEC price increases could occur in the mid- or late 1980s. Obviously, this urgently needed effort to increase domestic oil production and reserve creation will require vastly expanded investment and drilling activities by the U.S. oil industry.

In this regard, we feel it is unfortunate that a number of government officials have chosen to attack the motives of the oil companies rather than requesting their support in a mutual effort designed to alleviate this critical national problem. Indeed, it is imperative that the American public gain a full understanding of the nature of the problem that confronts us. Inflammatory rhetoric serves no useful purpose. Time is short. Let us not waste it in pointing fingers. Instead, we must make every effort to ensure that we devote our energies—indeed, our national will—to solving this country's energy problem.

#### CRUDE OIL PRICE DECONTROL

In this regard, President Carter's decision to decontrol crude oil prices in a phased fashion obviously took considerable political courage. It was a decision long overdue. For some time, it has been generally recognized that the continuation of price controls on crude oil was counterproductive to expansion of domestic oil supplies. Admittedly, this decision will result in short-term disruptions in the marketplace. As a result, some will criticize his decision.

For the long term, however, this decision was imperative, and we can only add another opinion that endorses President Carter for both beginning the decontrol process and for his wisdom in phasing the decontrol process so as to ensure that the inflationary impact will be spread out over time.

On the cost side of the ledger, we estimate that the decontrol measures will raise the 1979 inflation rate by 0.1 percentage points in 1979, by 0.3 percentage points in 1980 and another 0.3 percentage points in 1981. By the end of 1981, petroleum product prices will increase approximately 6 cents per gallon due to decontrol. Over the short term, these inflationary impacts will serve to slow economic activity and increase unemployment, although the magnitude of these impacts will be minor. It is worth emphasizing that all major forecasters agree that the economic impacts of phased decontrol will be near-term and minor.

On the other hand, large long-term benefits will result from decontrol. Both the quantity and the cost of oil imports will be lowered relative to what they would be under continued controls. As a result, the U.S. oil import bill will decline, the value of the dollar will increase, and the average price the United States pays for all imported goods and services will decline. These price declines of non-oil imports will initially help to offset the direct inflationary impacts of decontrol, and, unlike the direct inflationary impacts, will continue to increase in magnitude over time, so that by the mid-1980s or earlier, the general level of prices as measured by the CPI will be lower under decontrol than under continued controls.

Further, domestic productivity will also increase as we reallocate resources toward the production of greater amounts of cheaper domestic oil and oil substitutes and away from the production of goods and services for export, which in the absence of decontrol, would have been required to pay for additional oil imports.

As import prices drop and as productivity improves, economic growth will accelerate and standards of living will rise. Unfortunately, these benefits will be relatively slow in coming due to the time needed to replace current energy inefficient plant and equipment, and also the time needed to bring on line greater amounts of production of domestic oil and oil substitutes. Even by 1985, however, the net benefits will be substantial. As Charles Schultze mentioned in his Congressional testimony, there is probably no other single action the United States could take that by 1985 would produce as great an amount of oil import savings.

## WINDFALL PROFITS TAX PROPOSAL

The President has proposed that phased oil price decontrol be accompanied by a windfall profits tax. The windfall profits tax, in turn, incorporates two separate taxes, an "OPEC tax" and a "decontrol tax."

Under the "OPEC tax," all newly discovered oil (and after October 1, 1981, upper tier oil as well) would be taxed to the extent that OPEC price increases exceed the U.S. rate of inflation. As proposed, the OPEC tax would be permanent. Obviously, such a tax limits the future price incentive for finding new oil.

In addition, the "decontrol tax" portion of the windfall tax involved a tax on the bulk of oil obtained from currently producing oil wells, thus reducing the cash flow that otherwise would be obtained by the industry. As will be indicated shortly, internal cash flow is a particularly important determinant of future exploratory efforts in the crude oil and gas industry.

The windfall profits tax proposal is being justified by the Administration primarily on the basis that oil industry profits are in some sense too large and that oil industry revenues will rise with each new OPEC price increase.

While profits are commonly viewed as a source of income obtained from ownership of capital enterprises, and as such are often viewed with suspicion when they become large, it is much less widely appreciated that the level of profits and profit differentials among industries, and companies within an industry, also serve as important mechanisms for achieving the reallocation of resources necessary to promote economic growth. As long as investors are free to allocate capital where they wish, they will allocate it to those industries where they expect to gain the highest return, i.e., to make the most profit. Thus, an industry which is expected to be more profitable is likely to draw capital away from less profitable industries. Moreover, as more capital is applied to one industry relative to others, supply in that industry increases and prices fall relative to prices elsewhere. Thus, in this process, relative profits serve as a signalling mechanism for increasing production in high profit industries and decreasing production in low profit industries. Taxation of excess profits or regulation of prices is only warranted in those situations where free entry is not possible.

Sadly, these facts are not widely recognized. Instead, "excess" profits, that is, higher than normal or average profits, are viewed as "immoral" or "obscene", even if they are derived in a perfectly competitive way.

## RECENT TRENDS IN OIL INDUSTRY PROFITS AND INVESTMENT LEVELS

Unfortunately, there seems to be a persistent belief on the part of the Administration, and the public for that matter, that the petroleum industry is extraordinarily profitable and that price controls are needed to keep oil industry profits within reasonable bounds. This belief is not supported by the facts. Regardless of whether one uses traditional accounting measurements of return, such as return on equity, assets or sales, or measures of return based on discounted cash flow concepts or stock market performance, there is no evidence that the oil industry taken as a whole has had above average profitability, let alone excessive profits. Let us review some of the evidence.

Shown in Figure 1 is the average return on equity for 27 large oil companies in their U.S. operations as compared to the average return obtained by all U.S. manufacturing companies.

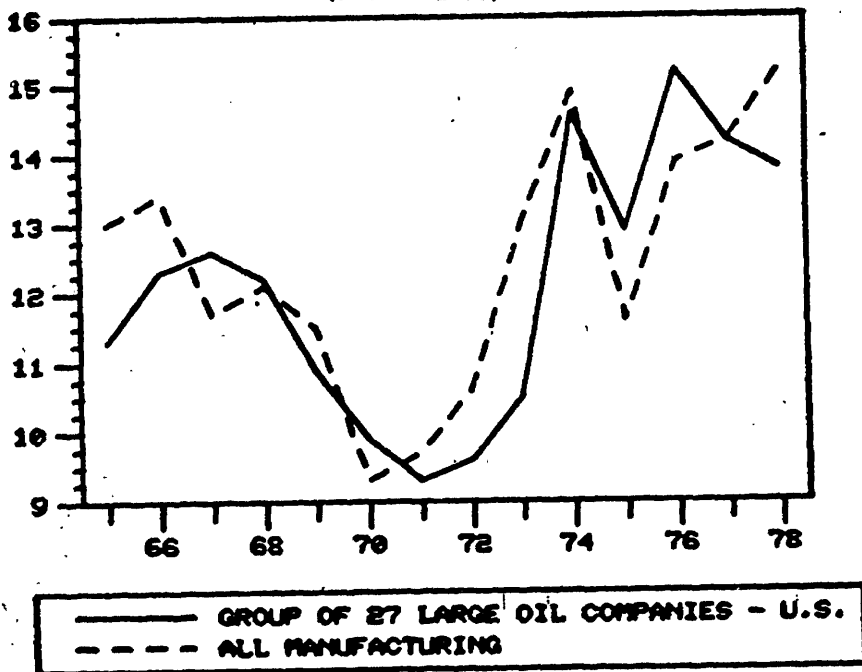
Until 1974, the return on equity in the oil industry was generally below that for all manufacturing. Then as a result of the rapid 1973-1974 run-up in OPEC oil prices, the rate of return in the U.S. oil industry accelerated in comparison to the rate obtained in all manufacturing. In the 1975-1976 period, the return was higher in the oil industry. However, by 1977, the differential had disappeared and by 1978 reversed. This comparison highlights the important fact that, on average, oil industry profits are comparable to those of other industries. Furthermore, there is no indication that monopoly profits have been made by the oil industry, even when several alternative measures of profit are employed.<sup>3</sup>

<sup>3</sup> Oil Industry Profits, Shyam Sunder, American Enterprise Institute for Public Policy Research, Washington, D.C., 1977.

FIGURE 1

RETURN ON EQUITY FOR 27 LARGE OIL COMPANIES FOR U.S.  
OPERATIONS AND FOR ALL U.S. MANUFACTURING

(1965 - 1978)



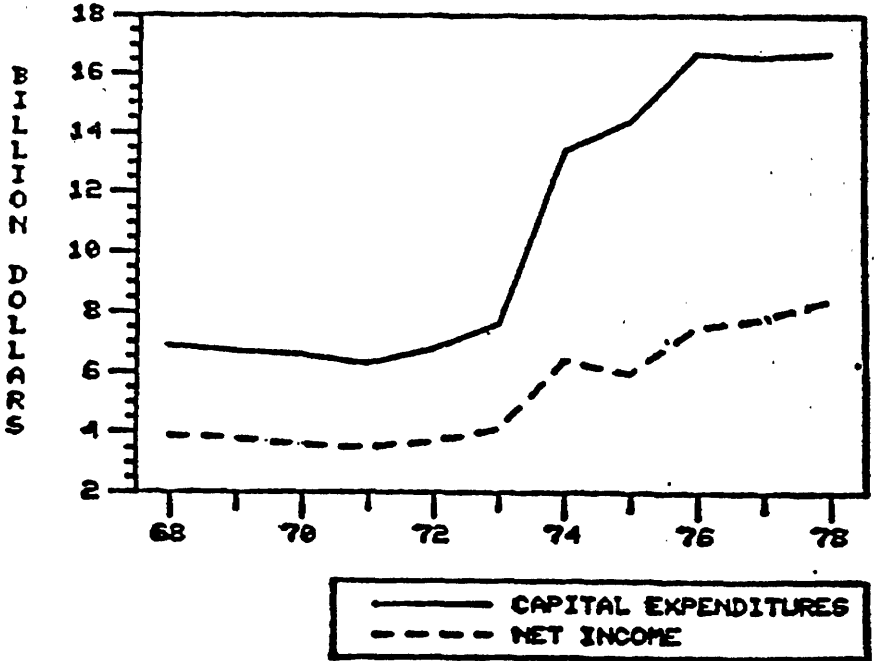
Source: The Chase Manhattan Bank, N.A.

For All Manufacturing, Federal Trade Commission Financial Reports, various editions.

Now let us look at the relation between oil company profits and oil company investments shown in figure 2 for a group of 27 of the largest oil companies from whom we collect financial data. Although it is more meaningful to analyze all sources of investment funds, not just profits, for the moment we have chosen to highlight profits and capital expenditures because that is where the public debate seems focused. Note that, in all years, the group's capital expenditure exceeds its net income. Moreover, between 1973 and 1976, when aggregate U.S. petroleum profits expanded rapidly, investment expenditures increased even more rapidly than profits, in both absolute and percentage terms. Since 1976, however, as the profit differential between oil and other industries narrowed, and as the rate of growth of aggregate petroleum profits sharply declined, investment has leveled off. Obviously, increased uncertainty over future energy policy and higher costs of capital have also played a role here.

FIGURE 2

U.S. PETROLEUM PROFITS AND U.S. PETROLEUM  
INVESTMENTS FOR CMB STUDY GROUP, 1968-1978



Source: The Chase Manhattan Bank, N.A.

TABLE 1.—COMPARISON OF PETROLEUM COMPANY INVESTMENT BY TYPE

	1968-72		1973-77	
	Amount (billions)	Percent of total	Amount (billions)	Percent of total
Production.....	\$17.2	51.4	36.6	53.2
Transportation.....	1.7	5.2	11.1	16.2
Refining and petrochemicals.....	6.9	20.6	13.7	19.9
Marketing.....	5.8	17.5	3.0	4.4
Other.....	1.8	5.3	4.3	6.3
Total.....	33.4	100.0	68.7	100.0

Source: Chase Manhattan Bank for the Chase group of companies.

Now let us consider how oil companies have been allocating their increased investment expenditures. As Table 1 indicates, capital spending in the 1973-1977 period was much more oriented toward production and transportation than in the previous 5-year period. Moreover, since 1973, the bulk of the transportation investments were related directly to the movement of crude oil from the producing areas. The expenditures for production and transportation purposes together, therefore, grew from nearly 57% of the total investments in the 1968-1972 period to over 69% in the 1973-1977 period.

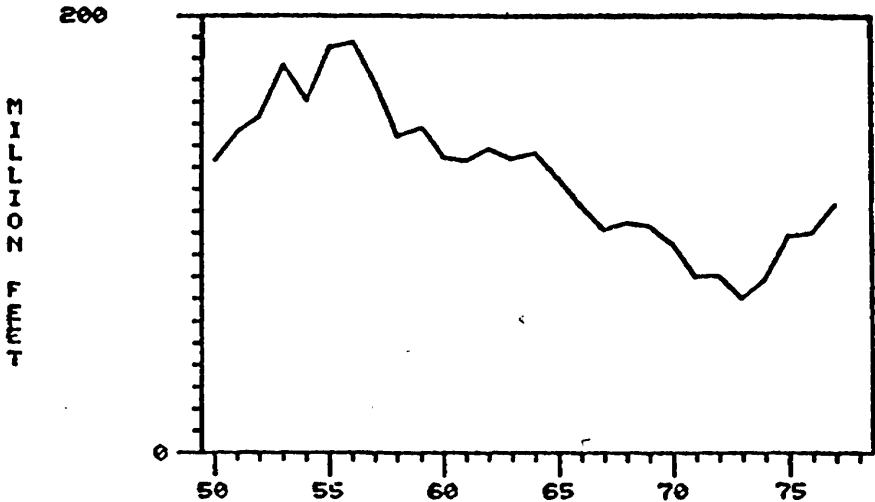
Recently, a great deal of attention has been focused on the magnitude of oil company investments outside the oil and gas industry. Our analysis of capital expenditures leads us to believe that the magnitude of capital expenditures outside the industry is extremely small in comparison to total expenditures made within the oil industry. That is, in Table 1, it can be noted that the share of capital expenditures going to "other" (which includes non-oil energy investments as a sub-segment) has held constant at 5-6% of total expenditures.

While it is true that an acquisition of a company's stock is not reported as a capital expenditure, examination of SEC Forms 10K over the last five years indicates the major non-capital expenditure acquisitions have been the well-publicized Mobil acquisition of Marcor, ARCO's acquisition of Anaconda, and SoCal's acquisition of 20% of AMAX. However, all in all, our analysis suggests such acquisitions represent a small fraction of the amount of funds that these firms reinvested in the oil business and that, on an industry basis, the outside investment has been all but negligible.

In summary, the hard dollar data totally refute the notion that major oil companies are neglecting their long-standing commitments to the U.S. petroleum industry and are diverting significant financial resources to other lines of business. In fact, the industry is devoting a greater share of its total investment expenditures to crude oil exploration and production activities, including drilling. As shown in Figure 3, since 1973, drilling activity has increased at a rapid rate.

It must be commented here that unfortunately, thus far in 1979 drilling activity has declined by over 20 percent from December 1978 levels due predominantly to uncertainty surrounding government regulatory (natural gas) and oil policy actions. Given the extremely serious nature of the U.S. energy problems, this governmentally-induced decline in U.S. drilling activity is a blatant indication of the failure of U.S. energy policy to date.

FIGURE 3

CRUDE OIL FOOTAGE DRILLED

Source: The Chase Manhattan Bank, N.A.

PECULIARITIES OF PETROLEUM INDUSTRY PROFITS

The question now arises as to whether the U.S. oil industry is different from any other industry in the U.S., that is, whether larger than normal profits can serve the same function in the oil industry as elsewhere in signalling the need for resource reallocation and in providing at least a portion of the required investment funds. Several arguments have been put forth to the effect that petroleum profits are different. Each is considered in turn.

The first argument is that:

## WINDFALL OIL INDUSTRY PROFITS EXIST DUE TO THE OPEC CARTEL

It is often alleged that the domestic oil industry is not entitled to the increased profits that would result from permitting domestic prices to rise to OPEC cartel levels, that is, the prices resulting from decontrol. *However, from the vantage point of the U.S., it is irrelevant whether the world oil price is a monopoly-set price.* This follows from the fact that the U.S. oil import bill represents the actual value of resources which the U.S. must give up through increased exports of goods and services or assets (capital flows) to obtain additional barrels of imported oil. Hence, the real dollar opportunity cost of all domestic oil production, old or new crude, is the OPEC price.

Let us see why the current controls on domestic oil prices are detrimental to U.S. standards of living. It can be shown that in order to obtain the most efficient use of our scarce capital and labor resources, domestic oil should be priced at OPEC levels despite the fact that OPEC is a cartel. The reasoning is that, under the current crude oil price control system, for every barrel of oil the U.S. imports at the current U.S. landed price of \$18.25 per barrel for OPEC crude, the U.S. must give up domestic resources also valued at \$18.25 per barrel. However, currently domestic oil producers received only \$13.00 for a barrel of new (or "upper tier") oil. As a result, the U.S. is expending more resources to pay for an imported barrel of oil than it is expending to produce a barrel of domestic oil.

As a consequence, the U.S. is not producing those quantities of oil which could be produced with fewer resources than we use for producing exports to pay for imported oil—namely all that oil which could be found and produced at costs ranging from \$13.00 per barrel to \$18.25 per barrel. For every additional barrel of domestic oil we produce costing less than \$18.25 per barrel, we obtain a net resource savings, which is then used for producing additional goods and services for consumption here in the U.S. The point is that, if the price of oil received by domestic oil producers is permitted to rise to the world level, we could get more oil for the resources used at home and reap increased real income in the bargain.

This is not to say that the OPEC cartel is not important with respect to determination of domestic crude oil profits. In an uncontrolled domestic crude oil market, increases in world oil prices will bring corresponding increases in domestic oil prices and profits will increase. *But this increase in domestic profits is desirable in that it will serve as the signal or incentive for further expanding domestic oil production until the costs of additional oil just match the new higher OPEC price.* That is, initial increases in profits are required to bring about the desired adjustment process, just as in any other industry.

Another argument often used to justify the windfall profits tax proposal is that: *Excess Oil Industry Profits Exist Since Crude Oil Is An Exhaustible Resource.* It is true that the oil industry differs from many industries in that additional (oil) production cannot be obtained at constant costs. Since cheaper oil deposits tend to be found first, additional oil can only be produced at higher costs—in the absence of technological improvements in discovery and production techniques. As a result, over time, the real price of oil will increase relative to the prices of other goods and services. This is a consequence of the fact that oil supplies of a given quality and in a specific location are finite in nature. This unfortunate fact of nature does not invalidate the role of profits as an incentive mechanism for encouraging greater production of the lower cost domestic oil to replace imported oil as its real price rises, once again even if due to a foreign cartel.

Supporters of the windfall profits tax also allege that:

*Increases in OPEC Prices Bring Unearned Windfall Profits on Currently Produced Domestic Oil.* While many oil industry critics grant that prices for new oil should increase with increases in the price of OPEC oil so as to assure more domestic production of new oil, they argue that the price of old oil currently in production should not receive OPEC prices. However, controls on old oil prices will limit the degree of expansion in new oil production for a number of reasons, as follows:

First, the rate of oil extraction from proven oil reserves, while subject to technological constraints, can be increased as the price received for the oil being produced rises. In particular, as the price of "old" oil rises, more expensive recovery techniques become economical and more old oil is produced. In general, as old oil prices increase, both annual production rates and the total cumulative amount recovered will increase.

Second, any limitation on old oil prices will affect producers' expectations as to the future prices to be received for new oil. That is, if the government puts price controls on old oil, the expectation will naturally arise that such controls will at some point be applied to new oil. As a result, when price controls are applied to old oil, producers will mark down their expectations as to the profitability of new oil, and exploration activities will consequently be cutback.



Finally, price controls on old oil, by limiting profits, will limit the amount of funds available for financing additional exploration for new oil deposits.

In short, price controls on old crude adversely affect both cash flow and expectations as to future (incentive) prices and therefore negatively impact exploratory activity and oil and gas production.

#### INCENTIVE PRICING AND THE OPEC TAX

As mentioned previously, the proposed windfall profits tax will reduce both future price incentives and current cash flow. Now let us quantify the detrimental effects which dampened price incentives and lowered cash flow can to have on exploration and development expenditures and therefore on future oil production. First we consider the role of price incentives and then the independent importance of cash flow in determining exploration and development activity.

The most damaging aspect of the windfall profits tax proposal is the so-called OPEC tax on new oil, because of the depressing effect it has on price expectations and the expected value of finding new domestic oil reserves and therefore on future oil production. In evaluating the OPEC tax proposal, it is crucial to note that:

First, every American producer is alert to the possibility of further OPEC price increases, and plans future exploration accordingly;

Second, capital gains on inventories of exhaustible resource reserves are not extraordinary and unexpected; rather they are an inevitable feature of the transition to more expensive energy resources, with or without OPEC;

Third, the importance of inventory gains in supporting development of a broader resource base is especially important in the oil business where the technology of reservoir dynamics requires 7 to 10 years production in working inventory; and

Fourth, increasing values of American oil resources (caused in this case by increasing OPEC prices), if passed on to American producers, will enable U.S. producers to search for and hold more expensive proven reserves in productive inventory. With rising reserve values, oil exploration efforts will "buy ahead" just as consumers are currently buying homes and autos in anticipation of further inflation.

Charles L. Schultze, Chairman of the Council of Economic Advisors, in his April 5, 1979 testimony before the Joint Economic Committee's Subcommittee on Energy, stated that, "Incredibly, under the current control system, we pay OPEC more for oil than we are willing to pay Americans who produce oil substitutes." He should have gone on to add that under current controls, we also pay American oil producers less for their oil than we pay OPEC for theirs, and further that, with the OPEC tax, we would permanently continue this counterproductive policy.

Recall that the OPEC tax is in fact a permanent excise tax on American oil producers of one-half of the increased value of their oil induced by OPEC price increases. This tax reduces the value of finding a new barrel of domestic reserves to producers, and reduces it more sharply, the higher the rate of OPEC price increase.

In this context, this is a puzzling tax proposal. The Administration has courageously advocated consumer price deregulation, permitting the consumer to face the true opportunity cost for oil—namely, what we must pay OPEC for it. This induces economic conservation. Further, it confronts OPEC with consumers' responses to price increases, thus dampening the monopoly profits accruing to OPEC that future OPEC price increases might reap.

Symmetrically, deregulated producers' prices would support economic development and production of new oil to supplant OPEC imports and confront OPEC sellers with effective competition from American producers.

However, by imposing a tax wedge between the market price and the American producers' price, the OPEC tax in effect permanently continues domestic producer price controls, with the severity of the tax increasing as the rate of OPEC price increases.

In summary, this OPEC tax would:

Lower exploration and new production incentives,

Increase the imports of OPEC oil which could be replaced cost effectively by American production (without the adverse balance of payments, exchange rate, employment, investment and national security impacts which arise from added oil imports),

Encourage greater OPEC pricing aggressiveness because the negative impacts of the OPEC tax increase over time and are magnified by increasing OPEC prices. This greater aggressiveness, in turn, will amplify the other detrimental effects.

The Administration's analysis of the impact of the OPEC tax is deficient in that it has not even presented a systematic analysis of changes in the magnitude

of the OPEC tax as a function of rising OPEC prices, let alone an analysis of the impacts of such high taxes on the expected value of new reserves, and therefore, future production.

To analyze these effects, Chase is developing a detailed long-term analysis of OPEC tax revenues and reserve values under alternative OPEC price scenarios.

The results of our preliminary analysis indicate that given an average annual growth rate of 2.5%/year in real OPEC prices, by 1990 the imposition of the OPEC tax will decrease the value of reserves by 22% from the value which can be expected in the absence of the tax. Given a 5.0%/year rate of increase in real OPEC prices, the value of reserves will decline by 29% in 1990 as a result of the tax. These 22% and 29% reductions in reserve values by 1990 caused by the OPEC tax, in turn, would lead to 1990 production declines of at least 800,000 barrels per day and 1,000,000 barrels per day, respectively. (A detailed technical report on this analysis will be available shortly.)

Finally, while we oppose the concept of the "OPEC tax" proposal, we also strongly oppose the \$16 per barrel price proposed by the Administration for the base price for the fourth quarter of 1979 to be used in calculating the proposed OPEC tax. On April 1, 1979, the average landed price of all U.S. crude oil imports had already reached \$18.10 per barrel and we expect that the price will increase to over \$19 per barrel by the fourth quarter of 1979. Thus, the Administration is not only proposing that all future, post-fourth quarter 1979 real price increases for new oil be cut in half, forever, but they are also proposing a start-up tax of over \$1.70 per barrel for every new barrel of oil for as long as it is produced.

Further, in estimating the tax burdens on the domestic oil industry as a consequence of the windfall profits tax, the Administration in its April 1979 release neglected to mention the magnitude of the very large tax burdens which would result from the OPEC tax, including the initial and permanent \$1.70 per barrel tax. This initial \$1.70 per barrel tax alone will cost the industry increasingly large sums over time, so that by 1985, the annual OPEC tax losses will be \$5.3 billion, while the cumulative 1980-1985 OPEC tax loss will be \$22.8 billion, assuming constant real OPEC prices. If OPEC prices rise at 5% per year in real terms, the cumulative OPEC tax loss would swell to \$61.0 billion over the 1980-1985 period. (See Table 2.)

The OPEC tax portion clearly dominates the decontrol portion of the proposed windfall profits tax. By 1985, as the Administration indicated, the decontrol tax burden on the industry would be a relatively small \$1.6 billion. However, the Administration neglected to mention the 1985 OPEC tax burden of \$5.3 billion, assuming constant real OPEC prices. Assuming a 5% per annum real growth in OPEC prices to 1985, by 1985 the decontrol tax portion remains at \$1.6 billion, but the OPEC tax becomes \$18.7 billion. *The Importance of Cash Flow as a Determinant of Oil and Gas Exploration and Development Expenditures.*

TABLE 2.—WINDFALL PROFIT TAXES ON PRODUCERS

(In billions of dollars)

Cases	1980	1981	1982	1983	1984	1985	Cumulative 1980-85
(1) 1980 decontrolled price, \$17.05; no increase in real OPEC price:							
Decontrol tax.....	0.8	2.4	2.8	2.0	1.8	1.5	11.3
OPEC tax.....							
Subtotal.....	.8	2.4	2.8	2.0	1.8	1.5	11.3
(2) 1980 decontrolled price, \$20.46; no further increase in real OPEC price:							
Decontrol tax.....	1.2	2.7	2.8	2.1	1.8	1.6	12.3
OPEC tax.....	1.2	2.8	4.1	4.5	4.8	5.3	22.9
Subtotal.....	2.4	5.5	7.0	6.6	6.6	6.9	35.1
(3) 1980 decontrolled price, \$20.67; 5 percent/year increase in real OPEC price:							
Decontrol tax.....	1.6	2.7	2.8	2.1	1.8	1.6	12.6
OPEC tax <sup>1</sup> .....	1.6	5.1	9.0	11.9	14.8	18.7	61.0
Subtotal.....	3.2	7.8	11.8	13.9	16.6	20.3	73.6

<sup>1</sup> Adjusted to include OPEC-type taxes which the administration has designated as decontrol taxes on upper tier crude oil.

Note: Detail may not add to totals due to rounding.

Let's consider next the cash flow impacts of windfall profits taxes of this magnitude. As we have just shown, besides limiting the magnitude of future real price increases, the OPEC tax portion of the proposed windfall profits tax will also adversely affect the future cash flow of the oil and gas industry. In a recent publication we have stressed the importance we place on cash flow as a determinant of capital expenditures, particularly for exploratory drilling.<sup>4</sup> Let us first summarize our position, and then respond briefly to a recent study financed by the Department of Energy (DOE) which criticizes our position.<sup>5</sup>

Crude oil and gas exploratory projects are subject to extremely high risks. Only 10 percent of all rank wildcatting projects yield *any* revenue, and of these, only a quarter yield enough to recover costs. As a result, commercial lending institutions will simply not lend funds for exploratory drilling efforts unless the borrower is certain to obtain a continuing cash flow from production from existing reserves. Even in this case, it is usually not prudent to use debt financing. The rationale is straightforward. Suppose the borrower uses up all the borrowed funds but experiences only a run of dry holes, so that his new debt expenses then just cover his after-tax cash flow obtained from production from existing reserves. At this point, further drilling cannot be financed; and, what is worse, his after-tax cash from production from existing reserves is reduced by the loss of current year write-offs previously obtained from drilling dry holes. The company is then unable to cover interest, debt repayment and the now higher federal income taxes. This problem has occurred in cycles in the past but always with the same result—increased oil industry concentration.

Since debt financing is generally not available for exploratory projects, these operations are normally financed by either internal cash flow or equity capital. Further, the availability and cost of equity capital depends on a company's track record with regard to internal cash flow and net revenue. However, in the past few decades, several non-traditional techniques were developed in an attempt to secure additional sources of financing—these include drilling funds, farm-outs and ABC payments.

*Drilling funds.* In the 1960's, drilling funds were at their peak and in aggregate raised somewhat over a billion dollars per year publicly and perhaps a similar amount privately. The drilling funds history was one of successes, large failures and frauds. Today, as a result of recent changes in the depletion law and in the tax treatment of individuals, the role of drilling funds is much more limited than in the past. In 1977, approximately \$500 million was raised publicly by drilling funds, a rather small sum versus the tens of billions the industry needs.

*Farm-outs.* Farm-outs are a trading of an interest in exploratory acreage for the assumption by another party of the obligation to drill. Unfortunately, the most popular farm-out arrangement used by domestic firms for exploration was recently ruled against by the IRS, so that the importance of this financial mechanism is also on the wane.

*ABC Payment.* It has been estimated that between the mid-1950's and the mid-1960's, \$3 billion of property acquisitions was financed through the ABC payment technique before the IRS removed the tax advantages accruing to it, and, in effect, terminated its usage.

This brief discussion was not intended to be an exhaustive one on exploratory activity financing, but merely to put the amount of funds available from non-conventional debt and equity sources into proper perspective. As we will see, such funds are extremely small when compared to the drilling effort required over the 1979-1985 period.

The seemingly obvious implication of this lack of alternative sources of funding for exploratory activity is that changes in cash flow affect exploratory drilling activity and that increased taxes which reduce cash flow obtained from production from existing reserves can easily deprive the nation of sorely needed incremental exploratory investment activity. In addition, such taxes could quite possibly lead to increased concentration in the oil and gas industry.

These conclusions, though disputed by the Administration, seem clear to us and, of course, to the industry itself. In a recent study financed by DOE, it was claimed that so long as the expected return on investment (ROI) for any project exceeds the cost of capital, the project will be undertaken, regardless of the company's cash flow outlook from current activities.<sup>6</sup>

<sup>4</sup>"The Impact of Continued Price Controls and the Crude Oil Equalization Tax (COET) on the Imported Oil Requirements of the United States," The Chase Manhattan Bank, N.A., Apr. 11, 1979.

<sup>5</sup>"Capital Resources and Requirements for the Petroleum Industry Under the National Energy Plan," ICF, Incorporated, January 1979.

<sup>6</sup>"Capital Resources and Requirements for the Petroleum Industry Under the National Energy Plan," ICF, Incorporated, January 1979.

This conclusion was reached not by addressing the issues just discussed, namely the reluctance of commercial institutions to lend funds for use in financing exploratory drilling projects. Nor did the study cite the results of consultations with petroleum industry financial people. Instead, the study cited the theories developed by academics, designed to handle a "typical firm." For many reasons, namely the extremely risky nature of petroleum exploration, the large percentage of up-front funds required for such investments, and the importance of writeoff expensing, it is clear that the financing arrangements for exploratory drilling projects are far different from the financing arrangements for a "typical firm."

The DOE-sponsored study also attempted to empirically measure the relative importance which cash flow played over the 1973 to 1977 period in financing crude oil exploration and development expenditures for 25 independent E&P firms. While the study claims that its results suggest that cash flow is not important, we find that the simple correlation of 0.61 (1.0 indicates a perfect correlation) found in the study between changes in cash flow and changes in investment expenditures to be remarkably large. This is particularly true given the following limitations of the study:

First, practical financial considerations suggest that cash flow particularly affects exploration projects. The study aggregated exploratory investment with development investment.

Second, the theory of investment being developed at the Chase implies that changes in incentive prices, in government regulatory definitions and procedures and in government leasing policies also affect investment expenditures in addition to changes in cash flow by varying both the number of potential projects available and the expected ROI on each project. The study does not control for these other determinants of exploratory activity, which invalidates their results from a statistical viewpoint.

Finally, ICF does not account for interaction between changes in cash flow and changes in equity financing. In particular, as previously mentioned, increases in cash flow, besides serving as an increased direct source of investment funds, also permits firms to obtain greater amounts of equity financing at lower rates. These indirect multiplier effects associated with increases in cash flow are also excluded from the DOE-sponsored study.

Since changes in cash flow affect investment levels, the decontrol tax portion of the Administration's program, by limiting the cash flow available from production from existing reserves and the OPEC tax by limiting cash flow from future reserves, should be expected to reduce future investment and drilling activity.<sup>7</sup>

The obvious question that must be addressed next is whether or not the domestic oil and gas industry's cash flow is "adequate" to meet our nation's energy requirements. In our view, the adequacy of cash flow must entail specific assumptions regarding the rate of proven reserve depletion. Given the magnitude of domestic oil and gas resources still in the ground, we define as adequate cash flow that level which will permit the funding of drilling activities sufficient, at least, to replace proven reserves at current production levels. Needless to say, we feel that is in the national interest that both incentive prices and cash flow be more than adequate, so that domestic oil and gas production can efficiently displace imported oil.

We have just completed the first phases of a detailed cash flow analysis similar to that which we did regarding COET. The findings are now equally dramatic. With the proposed Windfall Profits Tax in place, we would argue that it will be all but impossible for the domestic oil and gas industry to achieve even the relatively modest production levels forecast by DOE without a needless and extremely risky further run off in our nation's proven reserves.

Reserve replacement will require a cumulative capital expenditure on the \$350-400 billion range over the 1979 to 1985 period. With the Windfall Profits Tax in place, the industry would have to raise nearly \$100 billion in outside capital, an impossible task. Depending on the rate of increase of OPEC prices, the proposed Windfall Profits Tax will have siphoned off some \$20-40 billion of the required funding. In our view, this tax is not in the national interest.

The major difference between our view as to the adequacy of the oil industry's cash flow as compared to DOE's view is that we feel that proven reserve replacement is not only possible over the period but absolutely essential. In particular,

<sup>7</sup> In addition, as previously mentioned, such taxes will also dampen producers' expectations as to the prices to be received from future production. The reason is simple. Now that government policy action has all but established the tradition of taxing away the profits from OPEC oil price increases, producers will expect the government to continue to pursue such behavior with respect to newly discovered oil and future OPEC price increases. In fact, such expectations will be all but cemented if Congress passes this windfall profits tax proposal.

proven reserve replacement will help avoid a future even more rapid decline in domestic oil production, which, in turn, would further accelerate the recent deterioration in our standard of living and national security.

#### WINDFALL PROFITS TAX AND EQUITY

The above analysis strongly suggests that the windfall profits tax, and particularly the OPEC tax, will drastically limit future investment in domestic oil and gas exploration and development activities and, as a result, we do not view the tax as an appropriate energy policy option. Nevertheless, we recognize that legitimate equity concerns are raised by the decontrol of oil prices. However, to us, the real equity issue is not oil industry profits but rather what should be done to compensate the lower income households in general and particularly those lower income households that are currently locked into a high energy consumption lifestyle. Such people will be hurt by decontrol and compensatory measures seem to be in order. However, we feel such compensation should *not* be tied to oil company revenues, nor should it take the form of price controls; rather, the compensation should come via the income tax system through appropriately defined energy-related income tax credits or deductions.

#### CONCLUSION

In conclusion, I would like to restate the themes-interwoven throughout my testimony.

First, compared to profits in other industries, profits in the domestic oil and gas industry have not been excessive.

Second, in periods when domestic petroleum profits have increased rapidly both in absolute terms and in relation to profits in other industries, domestic drilling activity has increased.

Third, the primary objective of U.S. energy policy should be to decrease our dependence on oil imports. Further, this objective can most efficiently be achieved by providing greater price incentives and cash flow to domestic oil and gas companies via phased decontrol of crude oil price.

Fourth, by limiting price incentives and cash flow, the windfall profits tax will blunt much of the positive import reduction effects which will result from phased price decontrol. By just reducing the incentive prices, (as distinguished from its effect on cash flow) the OPEC tax's impact on the value of finding new reserves could easily increase oil imports by over one million barrels a day by 1990.

The cash flow impact of the windfall profits tax on domestic production could be expected to lead to an additional oil import increase of over one million barrels a day by 1985, with further increases by 1990 even assuming moderate post-1985 OPEC real price increases.

Fifth, it should be noted that the proposed windfall profits tax will serve to depress domestic production, thereby aggravating the long-term inflationary impact.

Finally, the real equity issue associated with decontrol does not concern the magnitude of oil industry profits but rather the effects of higher energy prices on lower income consumers. However, these issues are far more effectively handled by the income tax system than by continued controls or by decontrol coupled with the proposed windfall profits tax.

Needless to say, I will be pleased to try to answer any questions you may have concerning my testimony.

Senator GRAVEL. Dr. Carlson.

#### **STATEMENT OF DR. JACK CARLSON, VICE PRESIDENT AND CHIEF ECONOMIST, CHAMBER OF COMMERCE OF THE UNITED STATES**

Mr. CARLSON. Mr. Chairman, instead of going through our statement, I would appreciate the opportunity to summarize it and refer to some of the tables. I also want to indicate that the two preceding testimonies were outstanding pieces of work and will be helpful to the committee.

The national chamber supports the action to phase out Federal price controls on domestically produced crude oil in order to give U.S. producers the same incentive to produce energy as it is now

provided for all foreign producers. We expect decontrol to increase U.S. energy production by the equivalent of 1 million barrels per day by 1985 or 10 percent of domestic crude oil production.

Decontrol also will give American consumers the same incentive to conserve energy as that of consumers in other industrialized countries.

Conservation resulting from decontrol will save 1.2 million barrels a day by 1985. It should reduce foreign imports by 2.2 million barrels per day by 1985. That means we will be able to reduce the average American household's dependence on foreign oil by 1985 by the equivalent of 200 gallons of gasoline, or the equivalent of 40 percent of the annual gasoline consumption of one car, and 225 gallons of heating oil and other petroleum products.

The entire economy will benefit from decontrol. Employment can expect to increase by 160,000. Industrial production will increase by 0.6 percent. The trade deficit will shrink by \$14 billion. Even inflation will be restrained because the effect of oil supply from abroad will be less detrimental to the U.S. economy and this will more than offset the higher energy prices due to decontrol.

The national chamber opposes the President's recommendation to impose a so-called windfall profits tax, which is a new Federal excise tax. With this tax, the Government would siphon off incentives from American crude oil producers. This would cause Americans to lose considerable production compared to decontrol by itself.

This loss of production would cost \$1 billion, if not more, each year, in future years. Passage of this tax could lead to a similar punitive tax on producers of other materials and producers. For example, farmers may well fear in the future that the price fluctuations which were quite common in their sector of the economy would result in new Federal excise taxes on them.

Clearly, you can see the situation where fluctuation of prices in Wyoming and Montana may lead some to say with this precedent that we should have an excise tax put on producers of wheat or timber in Oregon, or cranberries in Maine.

We oppose the national security trust fund. We believe that the national trust fund creates bad fiscal precedent. The fund is likely to subvert the budget process and could lead to excessive Federal spending.

Moreover, we question the advisability of some of the projects that the President may be considering for support by this earmarked fund.

If they have merit, they should be able to withstand the public's scrutiny of the normal budget process and tradeoffs with other programs.

The national chamber continues to call for tax relief and slower growth of Federal spending in 1980 and a balanced budget by 1981. Tax relief will be a means of offsetting increases of energy costs to American households.

You have to understand the tax burden, just in the last reported quarters in 1978, shows an increase of \$1,000 per American household, so the burden is increasing rapidly, even before we were talking about energy cost increases.

Congress should prevent further increases in the effective tax rate on corporate profits. Since inflation began accelerating rapidly in 1972-73, this effective tax rate, after properly adjusting for statements of

profits and inventory accounting and inadequate capital consumption allowances for replacement costs, has climbed from 45 percent to 55 percent and is still increasing.

The real capital stock per employee in this country has been declining since 1975. More rapid growth in investment spending on new plant and equipment will be necessary to reverse the deterioration of productivity growth which has caused the average worker to produce about \$2,000 less output and receive about \$2,000 less income that you would have otherwise received during this time period.

The record high effective tax rate on corporate profits reduces the incentive to invest in productivity when such increases in investment are needed the most. Such investment would also help reduce inflation.

Decontrol will raise oil producers' profits. This is central to attract the capital needed for increasing domestic energy production.

The increase in profits will not be a windfall, but instead will increase capacity, reduce inflationary pressure, and increase productivity and jobs. The return on equity in the oil industry is about average when compared to other industries. The average profits are not sufficient to achieve the increases in energy capacity research and output which will be needed in future years.

Mr. Chairman, if I could just draw your attention to some of the tables in my prepared text, table 1 on page 5 shows our estimate of the improvement and conservation that would come from decontrol alone, and also the improvements that would come from increased production, and that is where we estimate our figure for 1985: 2.2 million barrels a day decrease in imports by 1985.

Table 2, on page 6, shows the impact on the economy. Clearly it shows that decontrol would have a stimulating effect on the economy, causing GNP to grow, industrial production to grow, employment to grow, the trade deficit to decline or surplus to appear in the future, and the rate of inflation in the first instance—some figures were left out of here—the rate of inflation increase per year is 0.3 to 0.7, a range there for the 1980–82 period; 0.2 to 0.6 for the 1983–85 period.

The key thing is that we would be less subject to disruptive influences from abroad, so this may even, during that period of decontrol, actually cause consumer prices to be lower than they would otherwise be because of the improvements that would come from less dependence on oil from abroad.

Table 3, page 7, is our first estimate to show the improvement on a State-by-State basis on how much gasoline would be available per household and how much heating oil would be available per household, just from the increase in production.

If you included the conservation, those numbers would be double the figure that you see there.

On page 9, inasmuch as there was considerable concern about profits in general, not only in the oil industry, there is a calculation to show that we are having very serious problems with the growth of profits. After you make the proper adjustments that should be made—I refer to line 7—you find during the last four reported quarters that profits increased, in real terms, by only \$2 billion. After you make the adjustment for volume, profits per unit of output have actually gone down during the last four quarters.

Our Government estimates will come out on the 18th of this month, which will compare the very bad first quarter of 1978, when we had a

coal strike and bad weather conditions, with the profits in this first quarter, so it will tend to have a quarterly overstatement of what the true profit situation is over several quarters.

You see in the first quarter of 1980, the profit figure from the first quarter of 1978 will not improve. In fact, it deteriorates. For those who like to look on a year-to-year basis, on page 10, table 5, you can see that adjusted profits, line No. 7, have decreased. After accounting for inflation, in the overstatement of the inventory accounting system and capital consumption allowances profits have decreased from 1977 to 1978, are forecasted to decrease from 1978 to 1979, and are forecasted to decrease 1979 to 1980.

This is highly unusual in a recovery period. What is most important, for those who worry about inflation, profits per unit of output show a decrease all these years. For those who worry just about the inflationary effect, profits are actually pulling down the rate of inflation, which, of course, reduces the incentive for investment in the short run—holding down inflation, not adding to it.

On the top of page 11, referring to graph 1, aftertax corporate profits as a percent of gross national product, you see before the adjustment a solid line which has been somewhat comparable in the past, but after you adjust it appropriately, and the Commerce Department provides these adjustments for the overstatement of profits due to inventory evaluations, you see that dotted line shows where there is a downtrend. So aftertax profits as a percent of GNP is becoming smaller. That is what is causing our investment position and productivity position to be in such bad straits.

On the top of page 12, you have a comparison of the only other long economic recovery in the postwar period, the one in the 1960's, with the current one. You see aftertax corporate profits as a percent of GNP is lower than in the 1960's economic recovery. We are doing badly compared to the earlier economic recovery.

On the top of page 13, graph 3, you have the nominal and effective corporate tax rates. The Congress thought that they were giving some tax relief last year for investment. This year, effective corporate tax rates are forecast to be higher because of the inventory valuation and capital consumption allowance adjustments, adjustments that had deteriorated because of inflation.

We find that the effective tax rate has been going up, not down. The effective corporate tax rate is now 55 percent of corporate profit, and it is forecast to increase.

Although you passed \$4.5 billion of tax relief for corporations last year, that is more than offset because of the accounting system dealing with valuation of inventories and dealing just with capital consumption allowances alone. Those adjustments fully offset that decrease in the tax. So we have less incentive to invest this year than we did last year.

We will have less incentive next year, if something is not done.

On the top of page 14, graph 4 shows the effective corporate tax rate during current and 1961 business cycles. You can see the effective tax rate is much higher this time around than in other business cycles. In the only other long run, the effective tax rate actually decreased down to 40 percent during the cycle, whereas now we are taxing 55 percent.

Of course, the bottom line here is on the top of page 15, graph 5. Real net capital stock per employee has been decreasing so we are



asking the more workers we have in the economy to be satisfied with the old equipment that they have, and not to have the modern equipment. No wonder that productivity growth has slowed down. This is the bottom line of reducing the incentive to invest. The incentive to invest comes from profits.

We have a productivity loss. If we had not had the slowdown in productivity growth in the last 10 years in comparison with the preceding 20 years, the average American household would be earning and producing \$3,700 more in this year; and if we do not make an improvement from this point on, in comparison with the current tax, the average productivity per household and income will be \$5,000 short. So we are talking about big stuff here in terms of the incentive to invest and profits being that particular incentive.

I refer to the top of page 16, real net capital stock per employee, to show how badly we are doing in comparison with other economic recoveries. The current one shows it is declining. The other recovery shows that the increase, the output per hour per productivity of workers in this country, reflects the fact that the modern equipment is not there for them, consequently their productivity has slowed down considerably.

Mr. Chairman, my colleagues have handled the specific problems dealing with profits in the oil industry. All of the points that were included in the rest of my testimony have been touched on by them.

I would appreciate it if the whole testimony could be inserted in the record.

Senator GRAVEL. Thank you very much. Very fine.

[The prepared statement of Dr. Carlson follows:]

STATEMENT OF THE CHAMBER OF COMMERCE OF THE UNITED STATES BY  
DR. JACK CARLSON

I am Jack Carlson, Vice President and Chief Economist of the Chamber of Commerce of the United States. I am accompanied by Christine L. Vaughn, Director, Kenneth D. Simonson, Tax Economist, and Charles W. Wheeler, Tax Attorney of the Chamber's Tax Policy Center, and by Talbott C. Smith, Director, Energy and Resources Policy for the Chamber. We welcome this opportunity on behalf of the National Chamber's 85,000 members to comment on oil price decontrol and profits.

CHAMBER POSITION

The National Chamber supports actions to phase out federal price controls on domestically produced crude oil during the next 28 months, in order to give U.S. producers the same incentive to produce energy as is now provided for all foreign producers. We expect decontrol to increase U.S. energy production by the equivalent of 1 million barrels of oil per day by 1985, or 10 percent of current domestic crude oil production. This means that we will be able to reduce the average American household's dependence on foreign oil in 1985 by the equivalent of 90 gallons of gasoline and 101 gallons of heating oil and other petroleum products. Decontrol will also give American consumers the same incentive to conserve energy as that of consumers in other industrialized countries. Conservation resulting from decontrol will save 1.2 million barrels of oil per day by 1985. Both conservation and increased U.S. energy production should reduce foreign oil imports by about 2.2 million barrels per day by 1985.

The National Chamber opposes the President's recommendations to impose a so-called windfall profits tax, which is nothing more than a federal excise tax. With this tax, the government would siphon off incentive from American crude oil producers. This would cause Americans to lose 100,000 to 200,000 barrels of domestic production per day, compared to decontrol without the tax. Replacing the lost production with foreign oil would cost \$1 billion each year by 1985. Passage of this tax could lead to similar punitive taxes on the producers of other materials and products, such as wheat or sugar.

The National Chamber opposes the President's recommendations for an "Energy Security Trust Fund" to spend the proceeds from the excise tax and from unspecified amounts of additional income taxes to be derived from decontrol. We believe that earmarking revenues in this way creates bad fiscal precedent. The fund is likely to subvert the budget process, and could lead to excessive federal spending. Moreover, we question the advisability of some of the projects that the President has suggested would be supported by this fund. If these projects have merit, they should be able to withstand the public scrutiny of the normal budget process.

The National Chamber continues to call for tax relief and slower growth of federal spending in 1980. This would be a means of offsetting increases in energy costs to American households. Moreover, Congress should prevent further increases in the effective tax rate on corporate profits. Since inflation began accelerating rapidly in 1972 and 1973, this effective tax rate (adjusted for inventory gains and underdepreciation due to inflation), has climbed from 45 percent to its present level of 55 percent.

The real capital stock per employee in this country has been declining since 1975. More rapid growth in investment spending on new plant and equipment will be necessary in the future to increase productivity and jobs. This high effective tax rate on corporate profits reduces the incentive to invest when we need it most.

Decontrol will raise oil producers' profits. This is essential to attract the capital needed for increasing domestic energy production. The increase in profits will not be a "windfall" but instead will increase capacity, reduce inflationary pressure, and increase productivity and jobs. The return on equity in the oil industry is about average when compared to other industries. But average profits are not sufficient to achieve the increases in energy capacity, research, and output which we will need in coming years.

#### DECONTROL

The President has proposed to decontrol oil prices under authority granted him by the Energy Policy and Conservation Act of 1975. He proposes to decontrol the price of newly discovered oil immediately, and of lower tier and upper tier old oil in stages, starting June 1, 1979, and continuing through September 30, 1981. At that time, all controls on oil prices expire under the law. Lower tier oil is oil discovered before 1973. Upper tier oil is oil discovered between 1973 and June 1, 1979.

There are three ways in which lower tier oil is affected by this proposal. The first creates a new category of marginal properties based on well depth and production. For these marginal properties, 80 percent of lower tier oil will be released to the upper tier on June 1, 1979. The remaining 20 percent will be released to upper tier on January 1, 1980. Second, producers may release specified quantities of lower tier oil to the upper tier to finance tertiary recovery projects, starting January 1, 1980.

All other lower tier oil gradually will be released to upper tier over a four-year period. A base period control level of production, equal to average production for six months ended March 31, 1979, will be established. The volume of oil considered to be lower tier oil starts out at 100 percent of the base period control level on January 1, 1979, and falls by 1½ percent of the original amount per month in 1979 and by 3 percent per month until October 1, 1981, when all remaining controls are lifted. Production volumes above this declining base period amount will receive tier prices. Those below will continue to receive the lower tier prices, adjusted for inflation, until October 1, 1981. From that date on, all oil will receive market prices.

The upper tier price will be escalated to the uncontrolled price in 21 equal monthly stages from January 1, 1980, until October 1, 1981.

Finally, as of June 1, 1979, newly discovered oil will be uncontrolled, that is, it will receive the world market price. In addition, incremental production from wells employing tertiary recovery and other specified enhanced recovery techniques will receive the market price as of that date. "Stripper oil" (oil from wells producing under 10 barrels per day), which is already uncontrolled, will continue to receive the market price.

All crude oil will be eligible to receive world market prices starting October 1, 1981, when controls expire. At that time, the current system of entitlements for refiners will also expire.

#### *Benefits of decontrol*

The National Chamber supports decontrol of oil prices as a major step to promote both domestic production and conservation. Decontrol will reduce our dependence on foreign oil sources by approximately 2.2 million barrels a day by 1985. The National Chamber believes that immediate decontrol of upper tier oil would be more beneficial to production and conservation than the President's

phased decontrol for upper tier oil. Immediate decontrol would also remove the substantial administrative burden posed by phasing out controls.

Decontrol is overdue. Oil prices have been controlled since August, 1971, when President Nixon instituted a freeze on wages and prices.

Some opponents of decontrol have argued that if we let domestic crude oil prices rise to the world level, we are in effect allowing OPEC to dictate the cost of petroleum products for American consumers. In fact, decontrol represents the quickest way to reduce our reliance on the OPEC cartel. Removing controls will give producers the assurance that they will be able to recover their costs of investment in new fields or in expensive methods of boosting production from worn-out and declining existing fields. As Table 1 shows, decontrol will have immediate and steadily growing benefits for both production and conservation. For instance, in 1985, domestic production of crude oil under decontrol will increase by approximately 1.0 million barrels per day above the levels that would occur with continued controls. At the same time, petroleum users will have greater incentive to conserve energy and to switch to more fuel-efficient products and production processes. Conservation resulting from decontrol will save roughly 1.2 million barrels per day by 1985.

TABLE 1.—EFFECTS OF DECONTROL OF DOMESTIC CRUDE OIL PRICES ON DOMESTIC OIL PRODUCTION AND CONSUMPTION

[In millions of barrels per day]

Year	Decrease in domestic demand for oil due to decontrol	Increase in domestic production of crude oil due to decontrol <sup>1</sup>	Oil import savings <sup>1</sup>
1979.....	0.2	0.08	0.28
1980.....	.4	.4	.8
1981.....	.9	.7	1.6
1982.....	.9	.9	1.8
1983.....	1.1	1.0	2.1
1984.....	1.2	1.0	2.2
1985.....	1.2	1.0	2.2
1986.....	1.3	1.1	2.4
1987.....	1.3	1.1	2.4
1988.....	1.3	1.1	2.4
1989.....	1.3	1.2	2.5
1990.....	1.3	1.3	2.6

<sup>1</sup> Assumes no real OPEC price increases after 1980 and no windfall profits tax.

Source: Chamber of Commerce of the United States, Forecast and Survey Center

Moreover, decontrol will eliminate the current complex and inefficient system of entitlements. Finally, higher oil prices will encourage greater production of other fuels which currently cannot compete against artificially low-priced oil.

The 2.2 million barrel per day reduction in U.S. oil imports which these effects will produce represents approximately 3 to 4 percent of expected world demand in 1985. The reduction will place downward pressure on foreign oil prices, or at least slow their rate of increase.

Ending mandatory controls will have a variety of beneficial economic effects, as shown in Table 2. By 1983-85, real gross national product (GNP) could be \$3.7 billion a year higher than under continued controls. Industrial production could be up by .6 percent and employment by 160,000 jobs, thanks to greater availability of oil. The reduction in imports could improve our trade balance by \$14 billion per year. Inflation may be slightly higher or lower, depending on the inflationary impact of oil shortages that would occur under continued controls.

TABLE 2.—ECONOMIC IMPACT OF DECONTROL OF DOMESTIC CRUDE OIL PRICES (AVERAGE ANNUAL CHANGE)

	1980-82	1983-85
Real GNP (billions of 1979 dollars).....	\$2.9	\$3.7
Percent change.....	.11	.14
Industrial production (percent).....	.3	.6
Employment.....	3,000	160,000
Trade surplus (billions).....	\$9.4	\$14
Rate of inflation (Consumer Price Index) (percent).....	.7	.6
Adjusted rate of inflation (percent) <sup>1</sup> .....	-.1-.3	-.6-0

<sup>1</sup> The adjusted rate of inflation represents the net increase in inflation from decontrol less the inflationary impact of a 2,000,000-barrel-per-day potential shortfall in oil supply which could result from continuation of controls.

Source: Chamber of Commerce of the United States, Forecast and Survey Center.

The increased domestic supply will mean that U.S. refiners will have a more secure source of petroleum for producing gasoline, heating oil, and other products for American consumers. Under decontrol, domestic oil will replace oil from foreign sources in the production of the equivalent of 90 gallons of gasoline and 43 gallons of heating oil for the average American household in 1985. This is shown for each state in Table 3.

TABLE 3.—POTENTIAL GAINS FROM ADDITIONAL DOMESTIC CRUDE OIL PRODUCTION DUE TO DECONTROL (1985)

	Additional gasoline and heating oil	
	Gallons of gasoline per household	Gallons of heating oil per household
United States.....	90	43
Alabama.....	99	35
Alaska.....	86	139
Arizona.....	84	37
Arkansas.....	103	38
California.....	92	18
Colorado.....	86	26
Connecticut.....	82	64
Delaware.....	90	65
District of Columbia.....	59	42
Florida.....	80	20
Georgia.....	101	28
Hawaii.....	61	25
Idaho.....	105	75
Illinois.....	90	44
Indiana.....	96	56
Iowa.....	113	46
Kansas.....	112	45
Kentucky.....	94	28
Louisiana.....	93	51
Maine.....	93	94
Maryland.....	79	43
Massachusetts.....	75	89
Michigan.....	93	41
Minnesota.....	97	54
Mississippi.....	90	43
Missouri.....	106	32
Montana.....	111	88
Nebraska.....	103	47
Nevada.....	112	31
New Hampshire.....	86	70
New Jersey.....	85	74
New Mexico.....	104	55
New York.....	62	54
North Carolina.....	92	31
North Dakota.....	124	61
Ohio.....	90	36
Oklahoma.....	117	30
Oregon.....	96	48
Pennsylvania.....	80	53
Rhode Island.....	80	80
South Carolina.....	97	24
South Dakota.....	124	49
Tennessee.....	96	35
Texas.....	110	37
Utah.....	92	59
Vermont.....	96	85
Virginia.....	90	41
Washington.....	94	41
West Virginia.....	89	32
Wisconsin.....	90	51
Wyoming.....	141	151

Source: U.S. Chamber of Commerce, Forecast and Survey Center.

## CORPORATE PROFITS

Administration sources and others have criticized recent increases in corporate profits as being "excessive." Such comments ignore the true size of profits and the role of profits in sparking economic growth.

The figure which drew the most criticism was the 26.1 percent increase in current dollar pretax profits between the fourth quarter of 1977 and the fourth quarter of 1978. This number is shown in line 1 of Table 4. Taxes on profits grew by 27.7 percent in the same interval. But these figures fail to account for the effects of inflation. Since appreciation of inventories due to inflation is a one-time gain and inventories must be replenished at higher prices in periods of high inflation, an adjustment must be made for this illusory part of corporate profits. Since under high inflation normal accounting methods do not enable firms to recover the replacement costs of their plant and equipment, a further adjustment must be made for this "underdepreciation".

When these adjustments (estimated by the U.S. Department of Commerce) are made, the increase in profits for the fourth quarter of 1978 becomes a much smaller 10.6% (line 6 of Table 4). When after-tax profits are then put in terms of constant dollars, the increase in real (constant dollar) profits from fourth quarter 1977 to fourth quarter 1978 is only 2.5% (line 7 of Table 4). This adjustment is made by deflating the two components of after-tax profits—retained earnings and dividends—by the deflators for fixed investment and personal consumption expenditures, respectively.

Anticipating reports on profits for the first quarter of 1979, Table 4 shows that the increase may be 21 percent even after adjustment. But profits must be observed over the business cycle to gain a true perspective. Adjusted profits are projected to fall 19.6 percent in the first quarter of 1980, to an even lower level than in the depressed first quarter of 1978, because slower economic growth has been forecast.

TABLE 4.—PROFITS OF ALL U.S. CORPORATIONS  
[NIA basis; billions of dollars]

	Actual			Estimated			Projected	
	4th quarter 1977	4th quarter 1978	Percent change	1st quarter 1978	1st quarter 1979	Percent change	1st quarter 1980	Percent change
Pretax profits, current dollars.	178.0	225.0	26.1	172.0	224.0	30.0	219.0	-2.3
Profits tax liability.....	74.0	94.0	27.7	70.0	89.0	27.4	87.0	-2.6
After tax profits.....	104.0	131.0	25.0	102.0	135.0	31.8	132.0	-2.1
Adjustment for inventory profits.....	-15.0	-28.0	.....	-24.0	-31.0	.....	-29.0	.....
Adjustment for underdepre- ciation.....	-15.0	-20.0	.....	-16.0	-22.0	.....	-31.0	.....
Profits from current production.....	74.0	82.0	10.8	62.0	82.0	31.1	72.0	-12.5
Adjusted profits, constant 1978 dollars.....	78.0	80.0	2.5	64.0	78.0	21.0	63.0	-19.6
Volume adjustment:								
Adjusted profits per dol- lar of gross national product.....	3.8	3.7	-2.2	3.1	3.6	15.3	2.9	-20.4
Wages and salaries per dollar of gross national product.....	61.3	61.4	.2	62.3	61.9	-.7	62.8	1.5
Government taxes per dollar of gross national product.....	35.4	36.3	2.4	35.7	35.6	-.3	35.4	-.5

Source: Chamber of Commerce of the United States, Forecast and Survey Center.

A different picture is also presented by examining corporate profits for the entire year, rather than quarterly. This is illustrated in Table 5 which shows a fall in adjusted profits between 1977 and 1978 and a sharp 12.5 percent decline in 1979, followed by yet another decline of 1.1 percent in 1980 (line 7). Adjusting for changes in the volume of Gross National Product shows even larger declines in adjusted corporate profits per dollar of output (line 8, Table 5).

TABLE 5.—PROFITS OF ALL U.S. CORPORATIONS

(NIA basis; billions of dollars)

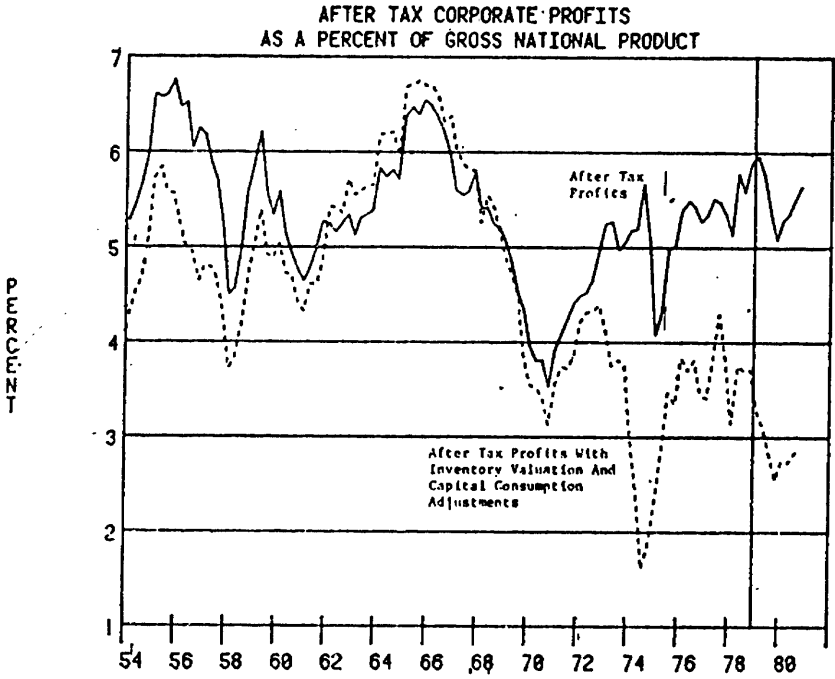
	Actual			Estimated		Projected	
	Year 1977	Year 1978	Percent change	Year 1979	Percent change	Year 1980	Percent change
Pretax profits, current dollars.....	174.0	202.0	16.2	214.0	5.9	232.0	8.2
Profits tax liability.....	72.0	84.0	16.9	85.0	1.7	92.0	8.0
After tax profits.....	102.0	118.0	15.7	129.0	9.0	140.0	8.4
Adjustment for inventory profits.....	-15.0	-24.0	-----	-32.0	-----	-29.0	-----
Adjustment for underdepreciation.....	-15.0	-18.0	-----	-25.0	-----	-34.0	-----
Profits from current production....	72.0	76.0	4.5	72.0	-4.8	77.0	7.1
Adjusted profits, constant 1978 dollars...	78.0	76.0	-2.9	66.0	-12.5	65.0	-1.1
Volume adjustment:							
Adjusted profits per dollar of gross national product.....	3.8	3.6	-6.5	3.1	-14.7	3.0	-3.4
Wages and salaries per dollar of gross national product.....	61.1	61.7	1.0	62.6	1.3	62.7	.3
Government taxes per dollar of gross national product.....	35.5	36.0	1.4	35.4	-1.7	35.5	.2

Source: Chamber of Commerce of the United States, Forecast and Survey Center.

*A longer term perspective on corporate profits*

A look at profits over the entire period since the Korean War shows that after-tax profits as a share of GNP today are no higher than normal. This is shown by the solid line in Graph 1. Profits adjusted for illusory inventory gains and under-depreciation have been low in recent years and are projected to fall still lower. This is shown by the broken line in Graph 1.

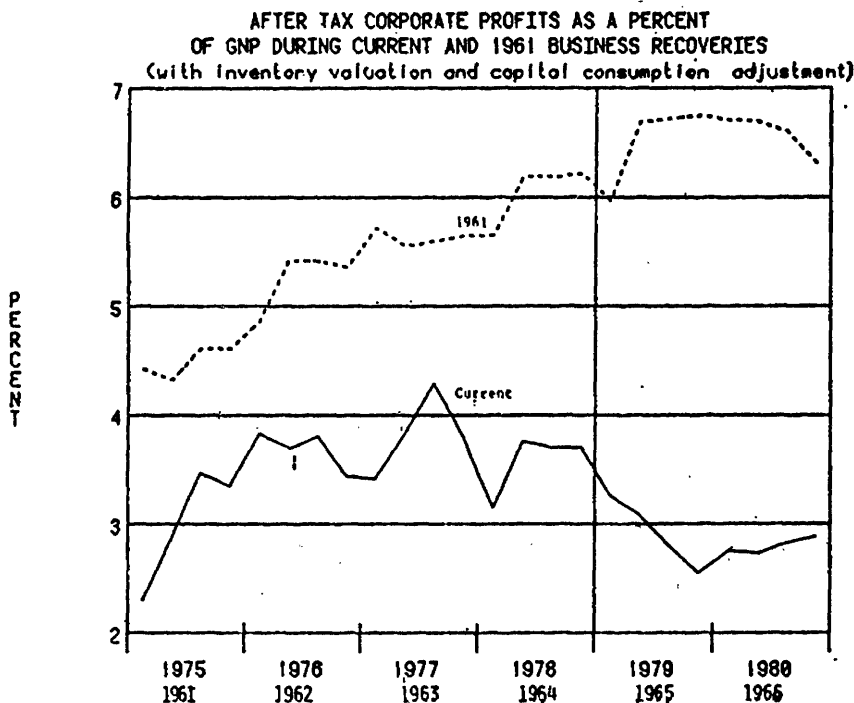
GRAPH 1



Source: Chamber of Commerce of the United States, Forecast and Survey Center.

Graph 2 shows corporate profits in the present economic recovery period compared to the economic recovery from 1961 through 1966, a period when growth in the economy, in personal income, and in productivity was high and inflation was relatively low. The early sixties is often cited as a post-war period close to the ideal in economic conditions. As Graph 2 illustrates, the profit share of GNP in the economic recovery beginning in 1975 has been much lower than the profit share of GNP in the recovery period beginning in 1961. And the corporate profit share of GNP is forecast to fall even further as we enter 1980.

GRAPH 2



Source: Chamber of Commerce of the United States, Forecast and Survey Center.

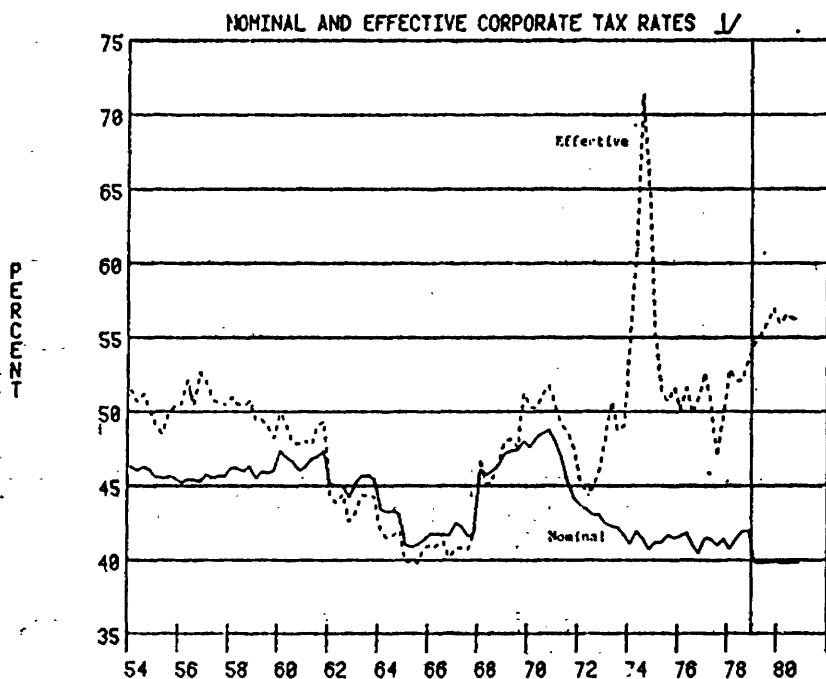
*The compound effect of taxes and high inflation on corporate profits*

High inflation sharply increases the federal tax burden for corporations, as it does for individuals. Graph 3 shows the difference inflation has made in the corporate profits tax burden by comparing the "nominal" corporate income tax



rate since 1954 with the "effective" corporate income tax rate, which adjusts pretax profits for illusory inventory gains and underdepreciation. Since the corporate income tax is calculated as a percentage of corporate profits before these adjustments for inflation are made, taxes as a percentage of the inflation-adjusted profits have risen much higher as inflation has climbed.

GRAPH 3

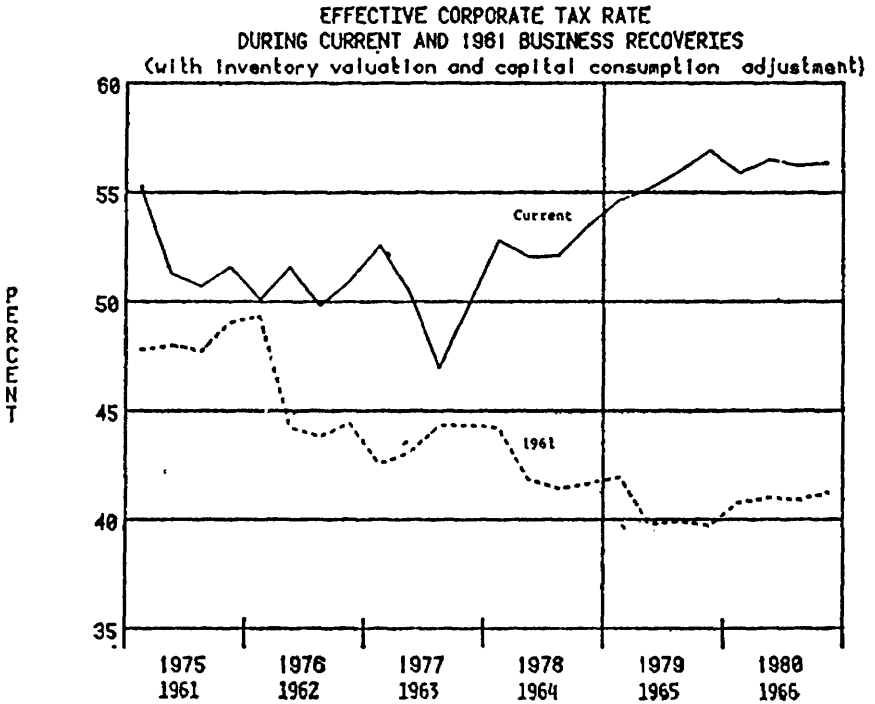


Source: Chamber of Commerce of the United States, Forecast and Survey Center.

Since 1972, inflation has increased in almost every year. Accordingly, the effective (inflation adjusted) tax rate on corporate profits has risen from 45 percent in 1972 to 53 percent in 1978 and is forecast to rise further in 1979 and 1980 in the absence of tax relief.

When the effective, or inflation-adjusted, corporate tax rate in the present economic recovery is compared to the same tax rate in the economic recovery beginning in 1961, it is readily seen that current corporate taxes are already very high compared to that benchmark period—and are expected to grow higher (Graph 4).

GRAPH 4



Source: Chamber of Commerce of the United States, Forecast and Survey Center.

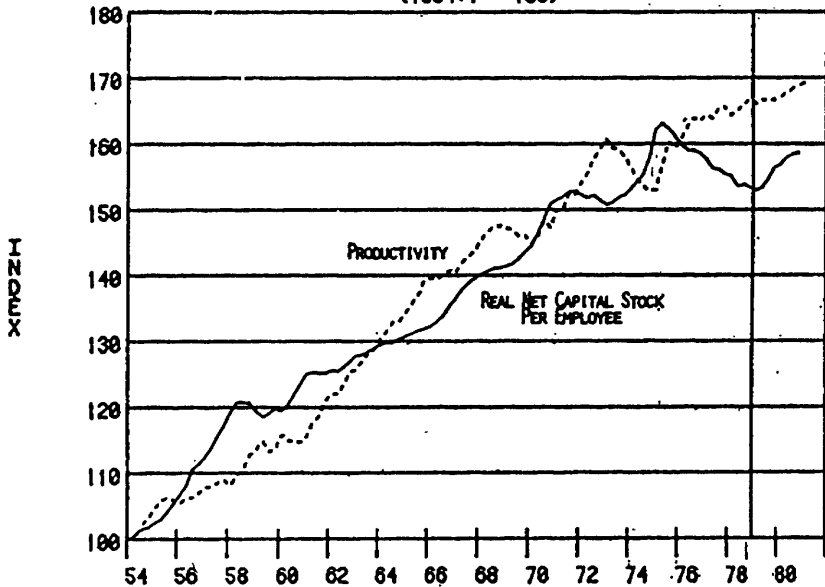
*Higher profits are needed as an incentive to increase investment*

The most important function of profits in our market economy is to provide an incentive to increase investment in new plants and equipment. The President's 1979 Economic Report states: "The most important inducement for investors is the prospect for future profits from future sales," (p. 127). Because they are the ultimate beneficiaries of the increased employment and output resulting from profits, consumers and workers have as big a stake in profits as investors. In the United States investment in new plants and equipment must be accelerated if we are to have the growth we want in productivity, jobs, and output.

Historically, there has been a close relationship between capital stock per worker and productivity. As Graph 5 illustrates, capital stock per employee has slumped since 1975.

GRAPH 5

REAL NET CAPITAL STOCK PER EMPLOYEE  
AND OUTPUT PER HOUR WORKED (PRODUCTIVITY)  
(non-farm business sector)  
(1954:1 = 100)

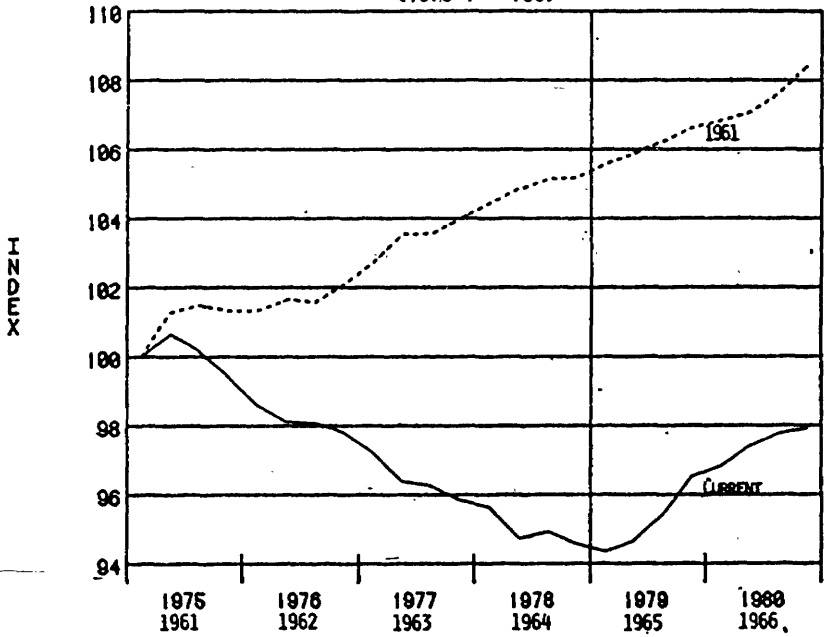


Source: Chamber of Commerce of the United States, Forecast and Survey Center.

A higher rate of investment spending will be needed to get capital stock per employee back on trend. We want that increase in investment spending because we want productivity to increase. If productivity per hour worked rises, then real income can rise accordingly. The way to get the increase in real income is to increase investment and the way to get an increase in investment is to increase profit. Higher taxes on profits are the wrong policy at the wrong time.

Graph 6 compared the capital stock per employee in the present economic recovery with the same ratio in the benchmark recovery beginning in 1961. The difference is apparent. Capital stock per employee in this recovery is much lower, partly because high effective tax rates on profits have made additions to capital too expensive or unattractive to investors.

GRAPH 6  
 REAL NET CAPITAL STOCK PER EMPLOYEE  
 DURING CURRENT AND 1961 RECOVERIES  
 (1975:1 = 100)

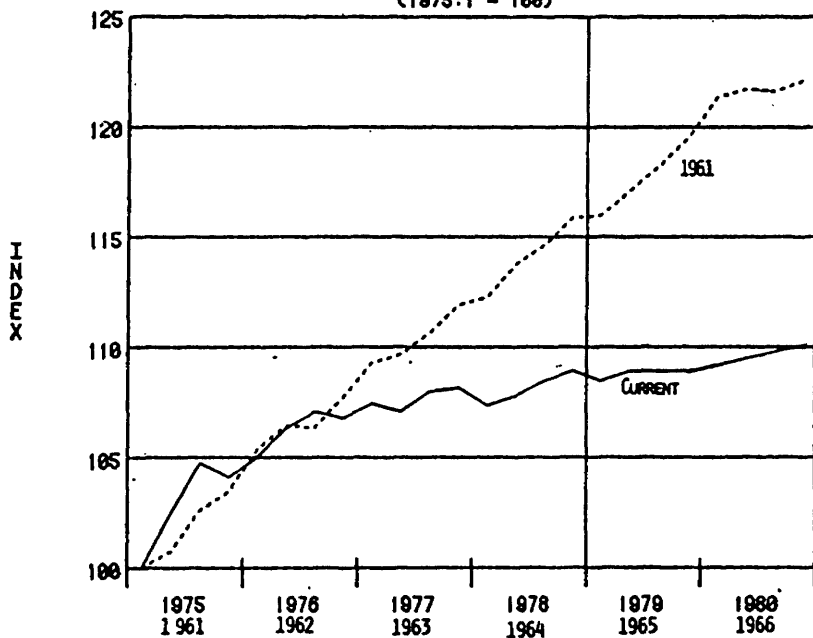


Source: Chamber of Commerce of the United States, Forecast and Survey Center.

Not surprisingly, productivity growth in the present economic recovery is also much less than productivity growth in the economic recovery beginning in 1961. This is shown in Graph 7.

GRAPH 7

OUTPUT PER HOUR WORKED (PRODUCTIVITY) IN THE  
NON-FARM BUSINESS SECTOR DURING CURRENT AND 1961 RECOVERIES  
(1975:1 = 100)



Source: Chamber of Commerce of the United States, Forecast and Survey Center.

The President succinctly summed up the investment problem in his Economic Report of January, 1978:

Business investment has lagged during the recovery for several reasons. Some of the fears engendered by the steep recession and severe inflation of 1973-75 have remained and have reduced the incentive for businesses to invest. Uncertainties about energy supplies and energy prices have also been a deterrent to investment, and so have concerns about governmental regulations in a variety of areas. Finally, high costs of capital goods and a depressed stock market have diminished the incentives and raised the costs to businesses of investment in new plants and equipment.

The solution he favored then, and one which is still correct today, is tax relief:

My tax and other economic proposals will encourage a greater rate of business investment in several ways. By promoting a sustainable rate of economic recovery, they will assure businesses of an expanding market for the output from new factories and equipment. The specific tax reductions for business I have proposed will increase after-tax profits and so directly provide additional incentives for investment.

#### PERSPECTIVE ON OIL INDUSTRY PROFITS

The Treasury Department did a useful job in pulling together statistics on oil industry finances for its testimony before this subcommittee on May 7. There is no need to challenge or duplicate the Treasury's work; instead, some perspective on the figures you received maybe helpful.

Among the most revealing statistics were those on capital outlays. These figures clearly show that oil producers reinvest available funds very heavily, particularly in comparison to non-oil companies. (See Table 6.) In each year for which data are available (1971-77), oil companies invested substantially more than 100 percent of net income, and close to 100 percent of cash flow. These investment rates are significantly higher than in other industries.

TABLE 6.—CAPITAL EXPENDITURES BY OIL AND NONOIL COMPANIES, 1971-77

	1971	1972	1973	1974	1975	1976	1977
<b>Capital expenditures:</b>							
Oil companies (billions).....	\$11.8	\$12.0	\$13.4	\$21.4	\$23.3	\$25.0	\$27.9
Nonoil companies (billions).....	\$21.1	\$22.3	\$28.7	\$37.1	\$34.3	\$35.6	\$ 2.8
Oil companies as percent of total.....	36	35	32	37	40	41	39
<b>Capital expenditures/net income (percent):</b>							
Oil companies.....	159	162	112	125	187	172	178
Nonoil companies.....	118	100	103	136	124	96	102
<b>Capital expenditures/cash flow (percent):</b>							
Oil companies.....	84	83	68	78	113	98	94
Nonoil companies.....	63	57	62	78	69	58	62

Source: Calculated from data supplied by Standard & Poor's Corp. Compustat file of approximately 3,000 corporations, as reproduced in appendix to statement of Emil M. Sunley, Deputy Assistant Secretary of the Treasury for Tax Policy, before the Subcommittee on Energy and Foundations of the Senate Finance Committee, May 7, 1979. Oil companies include oil and gas extraction plus integrated petroleum and refining companies.

Moreover, capital expenditures by oil companies have increased sharply, especially in response to crude oil price increases. For instance between 1972 and 1974, capital outlays by oil companies jumped 78 percent.<sup>1</sup> By 1976, oil companies accounted for 41 percent of total capital expenditures in this sample, up from 32 percent in 1973 at the beginning of the crude oil price rise. (See Table 6.)

These data strongly suggest that decontrol will lead to another surge in capital outlays by the oil industry. Most of these outlays are likely to go into exploration, development, and production of petroleum. Table 7 shows that investment in other firms account for a relatively small fraction of oil companies' uses of funds. Furthermore, most of the money spent for investment has been to acquire firms in oil-related businesses. Unfortunately, it is not possible to show this by segregating data on oil from nonoil investments.

TABLE 7.—INVESTMENT IN OTHER FIRMS BY OIL COMPANIES, 1971-77

	1971	1972	1973	1974	1975	1976	1977
Investment in others (billions).....	\$0.9	\$0.9	\$0.6	\$2.7	\$1.4	\$1.0	\$0.7
Total uses of funds (billions).....	\$18.4	\$18.7	\$25.3	\$39.1	\$32.1	\$37.0	\$38.4
Investments/total uses (percent).....	5	5	2	7	4	3	2

Source: See source for table 6.

<sup>1</sup> Data from the Joint Association Survey, conducted by the oil and gas industry, and from the Census Bureau's Annual Survey of Oil and Gas show that domestic exploration and development expenditures more than doubled between 1972 and 1974, rising from \$6.5 billion to \$18.1 billion. These data are not directly comparable to those in Table 6, because they are based on a different sample of producers.

How profitable are the oil companies? The two most common measures of profitability are after-tax rates of return on (1) stockholders' equity, and (2) total assets employed. As Table 8 shows, rates of return in the oil industry have generally been below, or only slightly above, rates of return in all industry. The only exception to this occurred in 1974, after world oil prices quadrupled. By 1975, oil industry rates of return were again comparable to those of other businesses.

TABLE 8.—RATES OF RETURN FOR OIL AND NONOIL COMPANIES, 1969-77

	(in percent)									
	1969	1970	1971	1972	1973	1974	1975	1976	1977	
<b>Return on equity:</b>										
Oil and gas extraction.....	12.6	11.4	6.7	7.2	10.6	19.9	15.0	15.2	14.7	
Integrated petroleum and refining.....	11.1	10.5	10.8	10.0	15.2	18.4	12.9	13.9	13.5	
Other industries.....	12.4	10.3	11.3	12.9	14.4	13.0	12.0	14.4	14.8	
<b>Return on assets employed:</b>										
Oil and gas extraction.....	9.0	8.5	6.0	6.0	8.3	14.0	10.3	10.4	10.2	
Integrated petroleum and refining.....	9.2	8.5	8.9	8.4	11.5	12.8	9.2	9.7	9.6	
Other industries.....	10.0	8.9	9.5	10.5	11.2	10.6	10.2	11.2	11.5	

Source: See source for table 6.

Another measure of profitability is return on sales. Here again, oil companies show only modest rates of return, amounting to between 2 and 3.5 cents per gallon of heating oil or gasoline.

As Energy Secretary James Schlesinger pointed out in reply to the question, "Do you think oil company profits are reasonable?" ("Issues and Answers", ABC Television, April 8, 1979):

At the present time, they certainly are reasonable. The profits have not increased in this industry since 1974. And in real terms, they have declined.

The oil companies are not doing spectacularly well in comparison to other manufacturing industry.

Thus, one may expect that decontrol will temporarily boost oil company rates of return, but not nearly as much as after the far steeper OPEC price increases of 1973-74. Such an increase in profitability is desirable, indeed essential, if the industry is to expand domestic production in the years ahead.

Complete data for 1978 are not yet available. But a look at the "Fortune 500" list shows that for the biggest oil companies, at least, profits continued in 1978 to be in line with other industries and with past years.

The 500 largest corporations ranked by sales, as compiled by *Fortune* magazine (May 7, 1979) include 31 petroleum refining companies and 10 mining and crude-oil production firms. These two categories had rates of return on equity in 1978 of 13.4 percent and 10.1 percent, respectively, compared to 14.3 percent for the entire 500. In 1977 also, both oil categories lagged the average of the 500 firms.

The 20 largest firms in the *Fortune* list in terms of sales include 10 oil companies. But none of these firms ranked among the top 200 manufacturers in return on stockholders' equity. In terms of total return to investors, which includes both price appreciation and dividend yield, the highest rank among these oil firms in 1978 was only 87.

Oil industry profits, then, have not been excessive. The oil industry has been no more profitable than other industries. Decontrol will increase profits, as it should if we are to encourage domestic oil production. But such increase will not result in any "windfall."

#### "WINDFALL PROFITS" TAX

The President has proposed a so-called "windfall profits" tax, actually an excise tax, to be levied at a 50 percent rate on three separate sources of oil producers' revenues:

(1) A lower tier ("tier 1") tax on revenues attributable to decontrol from the sale of some lower tier oil (oil from properties which entered production before 1973);

(2) An upper tier ("tier 2") tax on revenues attributable to decontrol from the sale of upper tier oil (oil from properties which entered production after 1972 and lower tier that has been reclassified); and

(3) A market incentive ("tier 3") tax on revenues from the sale of uncontrolled oil which are attributable to any future world crude oil price increases in excess of the general inflation rate.

The tax would take effect January 1, 1980, and would work as follows.

The Tier 1 tax would equal 50 percent of the difference between current lower and upper tier prices, adjusted for inflation. However, this tax would not apply to all oil presently classified as lower tier. The oil from stripper wells, marginal properties, and oil used to finance tertiary recovery projects would be reclassified and subject to the upper tier tax. The Tier 1 tax would only be imposed on a portion of the lower tier oil allowed to sell at upper tier prices after January 1, 1980. Under the decontrol plan, the amount of lower tier oil released to the upper tier will be increased by 3 percent each month. For tax purposes, however, only 2 percent would be considered as released each month. The Tier 1 tax would then be imposed on the oil that has been released to the upper tier under decontrol but is still considered to be lower tier oil for tax purposes.

The Tier 2 tax would equal 50 percent of the difference between the actual selling price and the current controlled price for upper tier oil, adjusted for inflation. This tax would apply to any crude oil receiving upper tier pricing treatment (including production from marginal properties and released lower tier oil not included in the Tier 1 tax base). Starting in November, 1986, the base price would be adjusted upward to the world price over 50 months, so that this tax would phase out at the end of 1990.

The Tier 3 or "market incentive tier" tax would take effect only if the actual world crude oil price rises at a faster rate than the increase in the market incentive price caused by domestic inflation (as measured by the GNP deflators). The tax would be permanent and would equal 50 percent of the difference. The market incentive price would equal \$16.00 per barrel for the fourth quarter of 1979. Until October, 1981, when all oil is to be decontrolled, this tax would apply only to newly discovered oil, production from stripper wells and incremental tertiary production. After that date, the tax would apply to all oil except for production from the Alaskan North Slope or the Naval Petroleum Reserves.

The National Chamber opposes any new tax on energy producers as unnecessary. The Administration's proposed excise tax, misleadingly called a "windfall profits" tax, is punitive and contrary to the goal of energy self-sufficiency. Currently, more than half of every dollar of additional revenue from domestic oil production winds up in government coffers through royalty payments (or income taxes on private royalty owners); state and local severance, property and income taxes; and federal corporate and individual income taxes.

The Administration acknowledges that they are not proposing a profits tax, because their tax would be levied on all designated production without regard to the producer's profitability. Yet they claim that they are only taxing the "windfall profit" from decontrol.

Decontrol, however, will produce no windfall. Instead it merely provides oil producers with the revenues they have been denied since price controls were first imposed. Congress mandated an end to price controls by September, 1981, when it passed the 1975 Energy Policy and Conservation Act (EPCA). At that time, it envisaged that domestic prices would equal world prices, with no suggestion that world prices represented a windfall. In fact, Congress has twice rejected proposals for "windfall profits" taxes as being unjustified.

The "market incentive tier" tax is potentially the most damaging part of the President's proposal. Unlike the Tier 1 and Tier 2 taxes which would expire respectively in 1983 and 1990, this tax would apply whenever world oil prices exceed the \$16.00 per barrel market incentive price, adjusted for inflation.

Moreover, the market incentive tier tax would make otherwise attractive domestic investments uneconomic. To illustrate this effect, suppose that the world oil price is \$20 per barrel in January, while the market incentive base price is \$16. Any new domestic production would be subject to a tax of 50 percent of the difference between these prices, or \$2 per barrel. Thus, producers who have a choice between developing wells in the United States or in a foreign area will choose the foreign area because of its higher profitability.

A similar effect would occur under the Tier 2, and possibly Tier 1, tax.

A popular expression among oil producers is "all of the easy oil has been found." While not literally true, the saying correctly indicates that most new production is likely to come from difficult, high cost areas. By penalizing production from those areas, when they are within the United States, the proposed tax would leave us with smaller reserves and less new production. Thus, our reliance on foreign production would grow still greater under this tax.



## ENERGY SECURITY TRUST FUND

The President has proposed the creation of an "Energy Security Trust Fund" to receive all revenues from the proposed excise tax on oil producers. For fiscal years 1980-82 the Fund also would receive an appropriation based on additional income taxes that are estimated by the Treasury to result from decontrol.

The revenues from the Fund would be used for three basic purposes: (1) assistance up to \$800 million per year to low-income households; (2) additional funds of up to \$350 million a year for "energy-efficient mass transit purposes"; and (3) a range of programs for long-term energy and environmental research, development, production, and conservation.

The National Chamber opposes establishing such a fund. By setting aside revenues for specific purposes, the fund is likely to undermine the existing budget process. This may lead to higher levels of overall receipts and spending than would otherwise be desirable.

All of the projects that the President has suggested for funding through the Energy Security Trust Fund should be considered through the normal budget process. In that way, funding levels can be kept consistent with other programs and priorities, including the priority of reducing the federal government's share of GNP.

Assistance for taxpayers affected by higher energy costs should be accomplished through general tax relief, not by earmarking a portion of this fund for welfare.

Creation of this trust fund could set a harmful precedent for providing special revenue sources for any given set of programs. Such earmarking of funds encourages continuing or increasing a tax for the sake of protecting the programs that it funds, even though the tax may have undesirable consequences.

Finally, the variability and uncertainty of the revenues earmarked for this fund will make funding of designated programs quite difficult. This is particularly undesirable for programs requiring commitment of money several years into the future, such as the capital expenditures and research and development projects which the President mentioned.

Senator GRAVEL. Next, Mr. Forrester. Nice seeing you again, sir.

**STATEMENT OF JAY W. FORRESTER, GERMESHAUSEN PROFESSOR,  
MASSACHUSETTS INSTITUTE OF TECHNOLOGY**

Mr. FORRESTER. Thank you Mr. Chairman.

We meet here to consider a so-called excess profits tax to be levied on producers of oil. But I want to ask, Are we making good use of our time? Does an excess profits tax on oil producers matter in the context of the energy problem facing the United States?

Before continuing I should summarize the energy situation in which we now find ourselves:

First present prices are now encouraging more energy consumption than is domestically producible at those prices.

Second the United States is becoming progressively more dependent on OPEC and more vulnerable to decisions made in the OPEC countries.

Third U.S. policies are supporting a massive transfer of wealth from the United States to foreign suppliers of oil.

Fourth lack of courage and leadership has prevented us from recovering from OPEC the initiative in energy.

Fifth present energy policies are driving down the value of the dollar forcing ever-larger exports to pay for oil and reducing the American standard of living.

To recover our self-sufficiency in energy the United States must take steps that will:

First, curtail imports of oil, so that we can limit our financial obligations to the oil-producing countries.

Second, recapture for ourselves the high excess profits on oil consumption that the United States is now paying as tribute to foreign oil producers.

Third, generate strong incentives for energy conservation.

Fourth, release American initiative, creativity, and financial resources to provide the energy supply and the energy efficiency that we need.

Fifth, reverse the present Government policies that bias our economic system toward using more energy and less labor, thereby producing an energy shortage and unemployment.

In comparison to the task confronting the Nation, the so-called excess profits tax is a mere diversion: it is capturing center stage in the political debate and is taking sorely needed attention away from the main issues. But an additional profits tax on energy production is worse than a diversion; it will prolong our wandering in the energy wilderness.

An additional profits tax on oil production will lead to less rather than to more energy. It will not reduce our imports; it will not increase incentives for conservation and energy efficiency; and it will not reduce our dependence on OPEC. An additional tax on energy profits, beyond the present corporate income tax, seems a matter of political expediency rather than a fundamental approach to the energy challenge facing the country. Personally, I do not care one way or the other about the oil companies as such, but I do care about economic stability, reduction of inflation, sustaining the dollar in foreign exchange markets, reducing our dependence on OPEC, freeing American creativity to solve our domestic problems, moving us toward a long term energy self-sufficiency, and stopping the squandering of our economic heritage as, in exchange for oil, we give up to foreigners ownership of American hotels, office buildings, corporations, and farmland.

Before going on to more effective policies, let me comment on the excess profits tax. The term itself belongs to political oratory, not to a penetrating debate of energy issues. In looking over financial data for the major corporations, it seems to me that the petroleum companies have been doing rather less well than many other large corporations in terms of profit related to assets, or profit as a fraction of stockholder equity, or profit as a percent of sales.

If the petroleum companies have done a major disservice to America, it is in having for 20 years provided energy at prices far lower than can be sustained in the future. Such low prices have led us into a pattern of energy waste. Energy has been so inexpensive that it has not been economically justifiable to insulate homes carefully. Very low-cost energy has led to the present pattern of dispersed suburban living and our dependence on automobile commuting. Transportation costs are so low that manufacturing has been concentrated and goods are shipped to all parts of the the country, rather than depending on local self-sufficiency and decentralization. The oil companies can be criticized for being a party to our own self-delusion about an endless supply of cheap energy, but not for having earned profits above those expected from other well-managed activities. We need more risk capital and more investment in energy, but the record shows no great financial

incentive for making such investment. Higher profits would attract financial capital and human skills to energy development and away from activities that are socially less necessary.

Additional tax on petroleum profits will substantially undo the incentives that are presumed to accrue from decontrol of oil prices. As such, we will once more be enmeshed in contradictory policies that postpone an aggressive solution to the energy imbalance.

An additional tax on profits will foster inefficiency in the oil companies. Rather than show profits that will then be taxed, strong incentives will exist to increase costs to use up the profits. Manpower will be stockpiled. Decisions will be postponed. Such a tax will extend the present holding pattern in which everyone is waiting for decisive policies aimed, without equivocation, at more energy, higher energy efficiency and less energy waste.

A higher tax on energy profits would be shortsighted. It might satisfy short term political objectives, but would work against the eventual resolution of the energy issue. We could expect the classic reversal that occurs in so many policy situations. More often than not, an action that is favorable in the short run is unfavorable in the long run, and vice versa. For example, a person who overindulges in the present may be penalized in the future by ill health. A nation that demands excessive services from government is later subjected to inflation and a falling standard of living. A company that takes the easy road and fails to maintain product quality will suffer later from falling sales. A person who lives above his means by borrowing heavily eventually must reduce his consumption while paying back his debts.

In the same way, a tax on oil profits may seem politically attractive now, but will continue to repel financial resources and managerial skills from the energy field and thereby prolong the energy shortage. For the last several years the country has been pursuing policies that met short term objectives at the expense of achieving an ultimate solution. An additional tax on energy profits will only prolong the period of vacillation.

If we want a long term solution, we must accept some short term disadvantages. With decontrol of oil prices, there will be a brief surge in profits of petroleum companies. That would, for some, represent a short term political cost. But in the long run, profits higher than in other businesses will attract financial investment, daring entrepreneurship, and technical skills. As money and talent converge on the energy area, energy supply will go up, competition will emerge, and prices will be driven down to those compatible with efficient production.

We should also be concerned about the symbolism of an excess profits tax. It says that any person or institution that succeeds in energy will be penalized. It says that money and talent should go into perfumes, or computers, or consumer specialities, but not into energy. It says the U.S. Government treats foreign producers of energy better than domestic producers.

OPEC is now collecting profits that are far more excessive than would domestic producers at the same price, because the cost of domestic production is above that of production in the oil-rich countries. Why are U.S. political leaders more incensed at the possibility of future short term increased profits within the United States than

at the exorbitant profits currently paid to other countries that will continue unless we take vigorous action? It is not because no action is possible. It may be because our aversion to short term inconvenience overpowers our concern for an enduring solution to this serious problem.

An excess profits tax is a move to redistribute income. But such a redistribution within America is of small consequence compared to the redistribution that is continuing from the United States to foreign producers. Profits to American corporations do not disappear from our economic system. They reappear in pension funds and in dividends to the broad base of U.S. citizens who are stockholders. Domestic profits are used for creating the capital investment necessary to reach deeper and less accessible energy deposits. Domestic profits become a basis for higher wages to American employees. By contrast, the excess profits to OPEC to which we now acquiesce must be paid in the form of products that we must grow and manufacture and give up to foreign buyers to repatriate the dollars paid for oil. In fact, excess profits are paid to other countries in goods that become unavailable to support the American standard of living.

Excess profits paid to OPEC are a far more serious matter than profits earned and redistributed domestically. Congress would better use its limited time to resolve the international aspects of oil economics, rather than bogging itself down in the emerging domestic excess profits tax debate.

The excess profits tax as proposed is an extra tax on the economy. It means additional money channeled through government. But the American public has strongly expressed its discontent with growing taxes and with government inefficiency in delivering goods and services. Proposition 13 in California and the proposed constitutional amendment to require balancing the budget both suggest public displeasure with still bigger government.

For the second time in 2 years, the President has presented an array of energy proposals that will be confusing and ineffective. Their presence on the agenda will delay consideration of the underlying issues, and they will introduce further cross-currents into an already turbulent debate. They are an attempt to deal with every aspect of energy supply and usage, but a government cannot cope with so many details at once. The proper role of government is to establish a few simple and decisive policies that will then induce each person in the country to fulfill his own best role to increase energy supply, conserve energy usage, and arrange for greater energy efficiency.

I now turn to a proposal for an energy policy that I believe would be effective for increasing energy supply, developing new kinds of energy sources, reducing energy waste, improving efficiency in energy usage, and regaining our independence from OPEC. The proposed policy is developed more fully in my paper "Energy Policy." I would like approval to include that paper as an appendix to the record of this testimony.

This proposal involves taxation but the implications are entirely different from those of an excess profits tax. It is aimed at a major reversal of incentives within our economic system. It should move us away from dependence on foreign oil and in time away from the declining supplies of domestic oil.

The proposal is for a heavy tax on the import and the domestic production of oil and gas, without price controls or an extra profits tax. The tax would be intended to produce incentives to conserve energy, induce private-sector development of alternative energy sources, and make domestic oil more competitive with imported oil. The suggested tax would be applied in steps until a sufficient response had occurred. The tax might reach \$20 to \$30 per barrel of oil or gas equivalent.

The revenue stream from such a tax would be tremendous, perhaps in the range of \$200 billion per year. But the economy is now so heavily taxed that no greater total tax should be levied and any excise tax on oil should be fully and completely compensated by an equivalent tax reduction elsewhere.

I notice that other witnesses have referred to the proposed profits tax as an excise tax. I look at this in a different manner. Just to keep the record straight, an excise tax is a tax on the production of a unit; a profits tax is a tax on the net revenue left as the difference between cost and revenue. I think these have totally different implications in terms of what they produce for incentives.

To continue, the only tax streams big enough to offset a substantial excise tax on oil are the individual and corporate income taxes. A \$20 per barrel tax on oil would substitute for a major fraction of the taxes collected in corporate plus individual income taxes. Such a substitution should make the oil excise tax acceptable because it would be a substitute of one tax for another without an increase in total taxation. But the payment of tax through the oil-usage channel would then become discretionary—it could be avoided by reducing the consumption of energy and shifting away from products with a high petroleum content.

Substitution of an excise tax on oil and gas in exchange for a reduction of income tax should increase employment because income tax is a tax on labor. Income tax is a heavy tax on the use of people. An employer can avoid paying the money with which an individual pays his income tax by not employing that individual.

For this reason, income tax is a powerful incentive to substitute the use of energy for people. At the same time, the Government is attempting to hold down the price of energy, thereby increasing the incentive to use energy and lay off employees. Partly as a result, we have an energy shortage and a labor surplus. I see an excise tax on oil as redressing the balance and creating pressures for higher employment as well as conservation of petroleum.

A high excise tax on imported oil should recover the oil pricing initiative from OPEC. If consuming countries set a high enough tax, the OPEC countries will be less able to price oil to include their present high profits. At a high enough price, imported oil will find stiff competition from domestic oil production and from a growing energy supply from nonpetroleum sources. Because OPEC countries are dependent on their sale of oil to support the development programs they have underway, they will be in financial difficulty if their price plus our tax makes OPEC oil noncompetitive. They cannot allow the total price to rise above what the market will bear, and the market will become selective and highly competitive when the price of energy is raised to its proper place within the balance of other economic forces.

An excise tax on petroleum-based energy should be noninflationary if it is fully offset by reduction of other taxes. It would shift the price balance within the economy, but not the total price level. Those products having a high energy content would rise in price and those products and services having a high labor content would fall in price.

At the time of the shift in tax basis, gross salaries and wages would be lowered by the amount of the reduction in income taxes. Net income would remain unchanged. Because the price of products and services would be adjusted to reflect both the lower cost of labor and increased cost of energy, purchasing power would also be unchanged.

An excise tax on petroleum energy should not be a hardship on low-income citizens. Like all other people, their disposable income would remain approximately the same and their cost of living would be essentially unchanged. Some prices would rise where energy is a dominant component; but other prices with labor as the major component, such as medical services and education and the distribution of goods, should decline in price.

The paper, "Energy Policy," which I have inserted in the record of this testimony, gives more detail on the proposal. I believe it is a simple policy, easy to understand, and inexpensive to implement. Carried far enough, with a high enough excise tax on oil-based energy, it should provide strong incentives for all consumers and producers of energy to take steps that are good for the individual and at the same time, good for the country.

In summary, I believe an additional tax on profits of petroleum producers would be a mistake. The so-called excess profits tax would delay the production of domestic energy, divert financial investment away from the energy industry, lead to inefficiency in the oil companies, and would not contribute to solving the energy imbalances that now haunt the country.

By contrast, an excise tax on petroleum energy would suppress demand. It would leave domestic producers the same price margin that OPEC would retain so that domestic oil could compete with foreign oil and thereby reduce our unfavorable balance of trade. A high enough price for oil will lead to conservation and more efficient use of energy.

I am much more optimistic about a high price leading to conservation of oil than some of the earlier witnesses. It seems to me that there is a tremendous opportunity there. Also, an excise tax on oil and gas would provide a price umbrella under which private enterprise would quickly and effectively develop the renewable energy sources to which we must turn, as oil is depleted.

Thank you.

[The attachments to the statement of Jay W. Forrester follow:]

**ENERGY POLICY BY JAY W. FORRESTER, GERMESHAUSEN PROFESSOR,  
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**SUMMARY**

Present government policies, by holding down the price of energy and levying high income taxes on people, produce strong incentives for excess use of energy and reduction of employment, leading to energy shortage and unemployment.

An effective policy would be a high tax on energy and a fully compensating reduction of individual and corporate income taxes.

A \$20 per barrel tax on oil and gas equivalent would permit more than a 50 percent reduction in all income taxes.

The resulting increase in oil price would give strong incentives for conserving energy and for developing non-petroleum sources of energy.

The pause in economic growth, once again being created by the economic long wave, allows time to replace the capital investment in oil-burning technology and build the capital plant for alternative energy sources.

An oil and gas tax that is fully compensated by reductions in other taxes should reduce rather than increase inflationary pressures.

The public is ready for a fundamental and effective solution to the energy problem. A substantial reduction of income taxes should make an energy tax politically acceptable.

Five years have passed since OPEC dramatically ended our unlimited access to almost free energy. What has happened since? Very little except debate. Of the few changes that have occurred, most are unfavorable to the United States.

The United States has relinquished to OPEC the initiative in energy policy without seriously debating how we could reestablish control over our own future. The United States has become increasingly vulnerable to unstable foreign governments as most recently made evident by the turmoil in Iran. A centralized Department of Energy has been created to regulate the billions of decisions that determine energy conservation and the millions of decisions that determine energy supply, but such multitudinous decisions will not be made effectively until solving the energy problem coincides with self-interest at the decentralized points where individual and business actions take place. Stopping inflation and solving the energy problem have come to be seen as conflicting goals rather than two faces of the same challenge. The public has been confused by a government that first likened the oil situation to a wartime crisis, then recommended a massive array of trivial and ineffective legislation, and in January 1979 offered a State of the Union message in which energy was given only nine words.

But such confusion arises not from willful intent by those in government to take the wrong direction. Nor can absence of a constructive energy policy be traced to selfish interests of energy corporations. To understand how we arrive at our present condition, we must first look beyond mere symptoms into the deeper behavior of our economic system. We must also understand how a social system presents signals that cause people to react in a counterproductive way. Only if we clearly perceive the underlying causes can we avoid such superficial responses as those so far taken in the energy situation.

Concern about the so-called "energy crisis" implies a fear of too little energy for the future. Therefore, the problem tends to be identified as failure of the private sector to supply enough energy; and the solution is seen in the form of government taking an active role to supply more energy. But things are often not what they seem.

#### *A. What is the energy problem?*

The energy problem is not meaningful in isolation from other issues. Do we have an energy problem or a political problem that prevents us from adjusting to changing situations? Is it an energy shortage or a population excess that is generating unachievable demands? Is energy price the problem or is it inflation from trying to live beyond our means? Is it an energy problem or a bank stability problem from the rising financial claims being acquired by the OPEC countries? Is it an energy problem or an agricultural problem as we use more energy to mechanize food production to pay for still more imports of energy? Is the energy shortage responsible for unemployment, or has too much energy caused energy and capital equipment to replace labor?

The perceived energy problem arises from expecting less energy in the future than we used in the 1960s and 1970s. So there is to be a change in energy availability between the past and the future. But what does the change mean? Is it too little energy in the future, or too much in the past?

We have just lived through three anomalous decades. In the recent past, energy consumption per capita has been higher than ever before in history, and probably higher than ever again in the future. But human memory is so short that we have accepted the recent aberration of excess energy as being the normal condition.

During the oil and gas era that is now drawing to a close, energy has been available in too great a supply and at too low a price. Even today, after the price of energy has increased, gasoline sometimes still costs less than water. Oil is brought from the Middle East, refined into gasoline, trucked to the corner filling station, and put in an automobile for less than the price of a gallon of local spring water at the grocery store. In fact, in real terms (deflated dollars) and after recent price

increases, gasoline today costs about the same as in 1955. In real terms, the price of gasoline declined by almost half from 1955 to 1970 and has in the last few years risen to resume its former position in the price structure.

For several decades, oil had become more and more easily available. Man has allowed himself to be misled by nature. The low cost of energy has seduced Western civilization into an extravagant use of energy and substitution of energy for other inputs to economic activity. Pressurized reservoirs of petroleum and natural gas have flooded us with energy and have encouraged usage rates that cannot long continue. Easy availability, wide distribution of energy supplies, and low costs of production have induced excessive substitution of energy and capital equipment for labor. The result has become an internal imbalance in patterns of living and production.

### *B. Imbalances involving energy*

The "energy problem" implies imbalance between available supplies of energy and expected rate of usage. Imbalances can mean too little energy or too much demand. But how can too much demand develop?

High demand is induced for any useful commodity that is almost free. Here lies the basic cause of the energy dilemma. Energy is deeply imbedded in all processes of a modern society. Energy trades off with and affects almost everything else. Availability of increased energy, resulting from the discovery of oil, has distorted the internal balance of both economic and social affairs.

Cheap energy has favored home designs that substitute energy consumption for thermal efficiency. Insulation has been reduced and more heat consumed. Houses have been spread across suburbia, necessitating increased transportation.

Low-cost energy for transportation has encouraged concentration of manufacturing with wide-spread cross-shipping of products. Regional self-sufficiency has been reduced, and industrial complexity increased.

Inexpensive gasoline has caused highways and trucks to replace energy-efficient rail transportation and has caused manpower and capital equipment to be drawn into the infrastructure of gasoline stations and auto repair shops.

Readily available energy has encouraged capital-intensive agriculture. Machines have displaced labor from farms to swell unemployment in cities. People believe the U.S. has high efficiency in modern agriculture, but efficiency exists only in the sense of output per man in the field. By many other measures, agriculture has become less efficient. Some five calories of energy now go into American food production for each calorie of food eaten. The agri-business sector has become a low-efficiency converter of petroleum calories into food calories.

Inexpensive energy has unbalanced not only the economic system but also the social system and politics. Energy has made large social institutions possible. But large institutions dwarf the individual and generate social alienation. Large institutions seem to require a counterbalance from large government, and political power becomes concentrated.

The imbalances that have arisen from an excess supply of energy now permeate homes, businesses, social structure, and government organization. Such imbalances are not static. They have been decades in the making. Their correction will take time. The imbalances are dynamic with changing and recurring patterns.

### *C. Long wave of capital construction*

Recurring economic patterns include the familiar 3-to-7-year business cycle, but I believe another recurring economic pattern is far more relevant to a discussion of energy. It is the long wave in the economy, which is also known as the Kondratieff Cycle.

The long wave provides a historical perspective for today's energy picture. As we contemplate a shift away from oil-driven economies, we should realize that several times in the past, major changes in energy sources have been successfully navigated. Energy from wood burning was replaced by energy from coal. Coal as the principal fuel was replaced by oil. Now we come to a move away from oil. Changes in energy sources have been accompanied by changes in transportation, agriculture, the technology of manufacturing, and the pattern of living. I believe major social and technological changes are part of the economic long wave.

The Western, market-driven, industrial economies have experienced long waves in economic growth. Long waves are spaced at intervals of 45 to 60 years. Each long wave starts with some 30 years of active capital construction; then expansion of capital plant continues during a decade of over-building to a point of substantial excess capacity; next, capital construction declines during a decade of economic depression while the old capital plant is depreciated and worn out; and finally, a new wave of rebuilding begins. I believe the great depressions of the



1820, 1890s and 1930s, were low points in the long wave I believe we are now at the peak of the present long wave. Such a long-wave peak foreshadows substantial reduction of economic growth in the next two decades.

A long-wave peak marks the end of a technological era. The collapse in capital construction that follows such a peak eventually opens the door to major changes in technology. The decade following a peak is a time in which to use up old capital plant, to test and demonstrate new methods, and to choose substantially different social and economic patterns for the future.

In our research on economic behavior at M.I.T., we have been drawn into examining the economic long wave through our work on the System Dynamics National Model. The National Model represents the physical and human processes that are to be found in any national economy. The model replicates the policies and structure that cause the unfolding progression of economic changes. Such a model brings social and economic structure into the laboratory where the relationship of policies to behavior can be identified.

The completed National Model will contain 15 industrial sectors, such as consumer durables, capital equipment, energy, agriculture, and building construction. Each industrial sector of the Model is constructed to represent a typical business firm in that sector of the economy. The Model represents production processes in comprehensive detail, and acquires the many inputs to production on the basis of inventories, prices, costs, order backlogs, growth rate, marginal productivity, liquidity, profitability, return on investment, and regulatory restraints. Each production sector of the Model contains a full accounting system that handles accounts payable and receivable, generates a balance sheet and profit-and-loss statement, pays taxes, and computes indices of financial performance. The market clearing function, which balances supply and demand, responds not only to price but also to availability of output product. This availability, or delivery delay, corresponds to market behavior in the real economy, where many prices change slowly and supply and demand are partially balanced by allocation and delays in filling order backlogs.

The first energy sector, this one representing fossil fuels, is now being added to the System Dynamics National Model. Energy is produced in the energy sector of the Model from a depleting base of natural supply that increases the cost of exploration and recovery. Energy as energy, energy prices, payments for energy, and energy availability all circulate separately in the Model. Energy is a factor of production in all sectors and is an input to utility in the household sectors. The Model handles both the supply and demand for energy and, through the production functions, allows energy to interact with other factors of production so that tradeoffs between factors like energy, labor, and capital can take place.

In contrast to most other models dealing with energy, the System Dynamics National Model contains a full coupling to generate the effects of energy supply on economic activity as well as closure from economic activity to the demand for energy to drive the supply side. When needed, other kinds of energy sectors not based on depleting supply can be included, such as high-capital-investment sectors based on solar or wind power. Policies affecting energy prices can be evaluated because energy and its price are fully interconnected with other variables in the Model.

In similar detail, the Model contains a labor mobility network for the movement of people between sectors, a banking system, the Federal Reserve, household-consumption sectors, a government sector, and a demographic sector. Such a model is a translation into computer language of the knowledge people have about organizational structure and operating policies surrounding their daily activities.<sup>1</sup>

Few people suspect the degree to which the puzzling complexities of business cycles, unemployment, depressions, and inflation arise from interactions between well-known and well-understood parts of the economic system. When a simulation model is constructed from policies, organizational structure, and physical processes that would be familiar to any businessman, the model produces the same troubling modes of behavior experienced in real life. Actual economic behavior is puzzling, not because of insufficient information about the parts of an economic system, but because, until recently, it has not been possible to show how well-understood parts interact to produce the baffling behavior of the whole system.

We did not undertake the National Model for the purpose of studying long-wave behavior. But when we assembled a consumer-durables sector along with a sector that produces capital equipment, we found that the Model exhibited strong

<sup>1</sup> For a more complete description of the System Dynamics National Model see "The System Dynamics National Model: Understanding Socio-Economic Behavior and Policy Alternatives," by Jay W. Forrester, Nathaniel J. Mass and Charles J. Ryan, *Technological Forecasting and Social Change*, vol. 9, Nos. 2 and 2, pp. 51-65, July 1976.

fluctuating growth and collapse in the capital sector with about 50 years between peaks of capital output. After we analyzed the reasons for the 50-year mode of behavior in the National Model, we concluded that the underlying assumptions in the model still seemed reasonable. Then the literature on the long wave was reviewed and compared with behavior of the National Model.

Literature on the long wave, or Kondratieff cycle, is filled with debate and conflicting assertions. Economic evidence has been interpreted differently by different observers. Until recently, there has been no cohesive theory to explain how an economic pattern spanning a half century could be systematically and internally generated. Because no theory of the long wave existed to show how the many aspects of reality could fit into a unified pattern, controversy was unavoidable.

We believe the National Model now provides a theory for how the economic long wave is generated.<sup>3</sup> The process involves an overbuilding of the capital sectors, which grow beyond the capital output rate needed for long-term equilibrium. In the process, capital plant throughout the economy is overbuilt beyond the level justified by the marginal productivity of capital. Finally, the overexpansion is ended by the hiatus of a great depression during which excess capital plant is physically worn out and financially depreciated on the account books until the stage has been cleared for a new era of rebuilding around a new mix of technologies.

Long-wave behavior, as revealed in the National Model, seems to explain many things now happening around the world. Current economic conditions are much like those that the National Model exhibits at a peak of the long wave. At such a peak one should expect a decline in new capital investment, rising unemployment, a leveling out in labor productivity, high interest rates, rising prices, falling return on investment, increasing amplitude of business cycles, and reduced innovation from maturing of the current wave of technological advance. Such conditions indeed fit today's situation. Similar conditions last occurred in the 1920s at the previous long-wave peak.

What does the long wave mean for the energy debate? It means that a historical precedent exists: at least twice previously our industrial society has made a major shift to a different source of energy. It means that a change in energy is not the only technological change to be expected in the next 20 years: in other industrial fields the current technology is becoming fully exploited and in many industries growth will slow down while entirely new technologies are woven into a very different unified pattern for the future. It means that the rapid growth in energy usage, as experienced in the last three decades, would have slowed anyway, even if there had been no energy crisis: the long wave produces its own pause in growth during which the stage is rearranged for a future based on new technologies.

#### *D. Low-level policies in energy*

To understand better our present energy frustrations, I turn now to the way social systems lead people into adopting ineffective policies. From our work on modeling corporations and economic systems, we find that most policies have little effect. Furthermore, people are usually drawn into attempting action through those very policies that have low leverage.

A low-leverage policy is one that the system itself counteracts. A low-leverage policy induces forces that oppose the intent of the policy. Such low-leverage policies are adopted because they appear to be directly related to the symptoms of difficulty. But the low-leverage policies fail to remove the original causes of the problem. In fact, low-leverage policies, while attempting to suppress symptoms, often strengthen the underlying causes of the symptoms.

The energy situation is a classic example of adopting counterproductive policies. The policies so far proposed by the President and adopted by Congress address symptoms, not causes. In doing so they worsen:

- Our dependence on OPEC;
- Inflation;
- Our balance of trade;
- The value of the dollar; and

Our future freedom of action as we sell to foreigners our hotels, corporations, and farm land to pay for oil imports.

*Symptoms.*—The energy crisis appears as not enough energy to fill the old demands. But insufficient energy is not a cause; it too is a symptom. The energy imbalance is a symptom of abnormally low energy prices in the past that have encouraged unnecessary consumption. The energy imbalance is also a reflection of past governmental policies that favored the use of energy rather than people.

<sup>3</sup> For a more complete discussion of the theory of the long wave as manifested in the System Dynamics National Model see, "Growth Cycles" by Jay W. Forrester, *De Economist* (The Netherlands), vol. 125, No. 4, pp. 525-543, 1977.

*Energy vs. labor.*—Energy prices have been held artificially low. As a result, energy has been substituted for other factors of production and utility. By contrast, the use of labor is heavily taxed. Income tax, Social Security tax, and payroll tax are taxes on labor.

Salaries and wages must be high enough that an employee can pay the taxes that are levied on him. An employer can avoid paying the taxes on labor by not employing people. Employers operate with strong tax incentives to substitute capital equipment and energy for labor. Government has created incentives to use energy instead of labor. Partly as a result of such distorted governmental policies, we now have an energy shortage and high unemployment.

*Conflicting motivation.*—Governmental energy policies thus far adopted are self-defeating because they establish conflicting motivations. Congress has legislated energy conservation policies while maintaining incentives for continued use of excessive energy. Use of energy is involved in almost every human decision. The important energy decisions occur in turning off lights, heating an unused room, living in an unnecessarily large house, joining a car pool, choosing an automobile, moving to the suburbs, deciding how far from work to live, choosing manufacturing processes, designing products, and centralizing industry in a way that uses more transportation. By maintaining low energy prices, government is encouraging energy use and undermining legislation aimed at energy conservation.

*Inappropriate policies.*—The policies thus far proposed by the President and passed by Congress are inappropriate for the role of government. The effort has been to legislate detailed control over private decisions and economic choices. A national government cannot successfully juggle a variety of tightly interrelated actions throughout the country. Government management of all production and use of energy means sweeping intervention in personal affairs. Government controls are not a suitable mechanism for making each of the multiplicity of detailed decisions that establish the balance between energy and other social and economic actions. So far, legislation has been activist in form in which the Government does the research and development, pays tax incentives for home insulation, enforces conservation, designs automobiles, and moves toward providing energy. But a more effective role for government policy would be to establish ground rules that induce individual and corporate creativity toward long-term solutions. Government will be most effective acting as the referee while others in the economic system provide the action.

*Complexity.*—A complex array of policies becomes self-defeating. Complex policies cannot be understood. They often appear contradictory. If of the activist form, government policies require a huge bureaucracy for enforcement. When criticized for not having an energy policy, Secretary Schlesinger was reported in the press as responding with pride that 132 different initiatives had been submitted to Congress. But a country cannot focus on 132 different policies. Each is seen as a small matter. Each person sees most of the policies as applying to others. Hundreds of government regulations cannot be comprehended, yet even hundreds are still insufficient to reach into the remote corners of the economy where the energy balance is decided.

#### *E. A high-leverage policy for energy*

Effective policy should be simple and should radiate strong motivation to all sectors of the economy. A high-leverage policy must address underlying causes. It should produce consistent motivations in different sectors of the economy. A high-leverage policy should set a broad framework within which individual freedom and initiative will be self-directed toward the common good. A government policy should be simple, understandable, easy to interpret, but even so should have pervasive influence.

*Heavy tax on oil and gas.*—A very heavy tax on oil and gas meets the requirements for a high-leverage policy. To avoid imposing an additional burden on an economy that is already taxed at a dangerously high rate, a tax on petroleum-based energy must be fully compensated by reducing other taxes.

*Compensating reduction in income taxes.*—An oil and gas tax must not be allowed to increase total taxes on the economy. The tax should not become an excuse for higher government expenditure. The tax should not be used to support energy-related government programs because that would defeat the objective of shifting energy decisions away from government and toward consumers and businesses in the private sector. Revenues from a high tax on oil and gas will be substantial until use of oil and gas are reduced. To be politically acceptable and to avoid an increased total tax load on the economy, the oil and gas tax should be fully compensated by a tax reduction elsewhere. The only tax stream big enough to compensate is the income tax. A \$20 per barrel tax on oil would substitute for more

than half of the total collected in corporate plus individual income tax. With a very substantial reduction of income tax, a high tax on oil should become politically acceptable.

*Increasing employment.*—A high tax on oil and a corresponding reduction of taxes on people should reestablish a more favorable balance between use of energy and use of labor. Energy-conserving work, such as insulating houses, would become economically feasible. Demand would rise for labor-intensive goods and services while demand would fall for those with high energy content.

*OPEC already taxing.*—A heavy tax on petroleum is not a new idea. In fact, it has already been implemented by others. OPEC is now taxing our use of oil. The high price of oil does not represent cost of production. The OPEC price is a tax to raise revenue. It is also a tax to restrain demand and to save oil for the future needs of the OPEC countries. The OPEC tax is lowering the U.S. standard of living by giving OPEC a claim on our output of food and goods, creating foreign exchange problems, and jeopardizing stability of the dollar.

*Recovering the initiative from OPEC.*—The United States should be able to take the initiative away from OPEC. If the United States and other consuming countries were to levy a high enough tax on oil and gas, the OPEC countries would be less able to do so. OPEC countries are dependent on the sale of oil to sustain their present economies. If they let price plus tax rise too high, demand will fall, and they will not be able to pay for imports on which they have become dependent. A U.S. tax should be able to divert revenues back from OPEC to the U.S. domestic economy. It should reduce OPEC claims on U.S. domestic production of goods while at the same time correcting internal imbalances between energy and labor.

*Effectiveness.*—A tax on petroleum energy, if high enough, would motivate conservation of petroleum. The price umbrella thus created would also motivate private development of alternative energy sources. A tax on petroleum at the well or the dock would be easy to administer. There would be nothing complicated to defy understanding.

*Gradual increase in tax.*—No one can predict how high the price of oil and gas must be to induce a sufficiently vigorous response in conservation and in creating alternative supplies of energy. Also, time is needed to take the required actions. Probably the best procedure would apply the oil and gas tax in steps to test the degree of response and allow time for the economy to adjust. But time is of the essence. A decade appears much too long for initiating effective action. A best compromise may be to increase the oil and gas tax at a rate of \$5 per barrel-equivalent per year until it becomes clear that the necessary responses are occurring. At a high enough tax on oil and gas, conservation will be encouraged. The argument that higher prices will not discourage use is, in effect, to say that a particular price is not yet high enough to motivate action. OPEC has levied a tax of some \$10 per barrel on oil. Much talk has resulted but not enough reduction in usage has occurred. The required tax rate apparently must be substantially higher. An additional U.S. tax of \$20 to \$30 per barrel of oil or equivalent in gas may be required. When the price of energy from oil and gas becomes high enough to cause people to change their consumption and living habits, incentives for conservation will have permeated society.

*Noninflationary.*—A high tax on energy that is fully balanced by tax reduction elsewhere would be noninflationary. Through favorable effects on balance of trade, value of the dollar, and domestic employment, a high tax might even lower the pressures that now sustain inflation.

*Eliminate price controls and excess profits taxes.*—An oil and gas tax should be accompanied by elimination of price controls and excess profits taxes related to energy. Price controls will not be needed if the tax is high enough to reestablish balance between supply and consumption and thereby maintain active competition. Excess profits taxes are detrimental in the long run because they penalize efficiency; "excess profits" will likely be absorbed in unnecessary costs rather than being paid to the government.

Proposals to tax "excess" profits overlook the role of profits in attracting financial capital and human skills to areas of economic need. Profits must be higher in energy than in other sectors of the economy long enough to accelerate development of new energy sources. Higher profits will increase competition and soon force down prices and profits.

Proponents of "excess" profits taxes have tried to drive a political wedge between the public and the oil companies. Although the oil companies have often acted in ways that shake public confidence, they are, nevertheless, the institutions that are supplying our energy needs. Total combined profits of all oil companies are comparable to the budget of the Department of Energy, yet the oil companies, not the government, are supplying the energy we use.

It is strange that we let fear of a profitable solution to the energy problem stand in the way of any solution. The U.S. willingly pays windfall "excess" profits to the OPEC countries but seems to find intolerable profits to American companies that would find their way into taxes, higher wages, stockholder dividends, and reinvestment in America.

*Encourage alternative energy sources.*—A high price for energy from oil and gas would provide the price umbrella under which the private sector could develop alternative energy sources. The present under-pricing of oil and gas stifles private initiative to move toward new kinds of energy, and expensive and inefficient government research and development programs are made to appear necessary. A gas and oil tax would encourage throughout the economy a diversity of new energy sources. Most alternative energy sources become feasible at prices around \$30 per barrel of oil. Oil and gas at a sufficiently high price will quickly induce numerous private-sector responses to create new energy supplies. Alternative energy sources are available for development on scales over the entire industrial spectrum from small businesses to major corporations.

*Political acceptability.*—A proposal for heavily taxing all uses of oil and gas must be accompanied by answers to political resistance. The principal objections will probably be based on doubts about personal hardships and inequities. But hardships from a tax should be less than hardships from not taxing. If an oil and gas tax is compensated by reduction in other taxes, the total tax load remains constant. Prices for other goods and services should decline relative to energy. The cost of living need not be affected. Energy and products with a high energy content would rise in price. But products with a high labor content would fall in price because of the reduced taxes on labor. There would be a shift of incentives toward conserving energy but there should be no increase in hardship. To the contrary, the standard of living should rise as we reduce OPEC claims on our industrial output and increase the opportunities for employment.

I have been fascinated by reactions of people to this proposal for a high tax on petroleum products. On June 1, 1977 I testified along these lines before the Subcommittee on Energy and Power of the U.S. House of Representatives Commerce Committee. I had expected strong disagreement. To my surprise, most members expressed personal belief that such a move was necessary and in time must be taken. But, they said, how would they explain it to their constituents? Since that time, I have made the proposal to a wide cross section of those constituents. Almost all agree. But, they say, how would they explain it to their Congressmen?

We may have arrived at a point where the public is ahead of its leadership. People want a fundamental solution that is good for the long term. There may now be a majority who want decisive and effective action while at the same time each person thinks he is alone. When an invisible majority exists, only leadership and explanation is necessary to crystallize opinion behind a high-leverage policy that will simultaneously yield energy conservation and new energy sources.

Senator GRAVEL. Thank you very much.

I have one question. First, I would like to place the statement in the record, by Senator Durenberger, who had to absent himself. [The prepared statement of Senator Durenberger follows]

#### STATEMENT BY THE HONORABLE DAVE DURENBERGER

Thank you, Mr. Chairman. When President Carter announced on April 5th his plan to gradually decontrol the price of crude oil commencing June 1st and ending on September 30, 1981, he said that decontrol now was necessary to: reduce consumption and encourage conservation, decrease imports from OPEC, increase domestic production, strengthen the dollar, and enhance our national security.

However, on April 23rd, the President seems to have shifted his emphasis from these laudatory objectives to an entirely different set of laudatory objectives. Now, the President appears most concerned that a windfall profits tax be enacted so that an Energy Security Fund could be established which would provide low-income assistance, enhance mass-transit improvements, and increase long-term energy research and development programs.

Given that decontrol is going to produce additional revenues for the producers—and there is some dispute as to how much money that will actually be—the single most important question we must resolve is how do we as a society, as the people's chosen representatives, want to control and dispose of that income.

I believe that low-income assistance, mass-transit improvements, and increased energy research and development are essential. But I also believe that we must produce more energy now. We must provide as broad a base of alternative sources of energy as quickly as possible so that we will have a competitive marketplace for energy. Consumers have a right to be able to choose amongst competing sources of energy, for only then will we see a cap to the ever-increasing costs of energy.

My main reservation about the President's plan is that if we end controls on prices without significantly increasing the available supply of energy, then we consumers will continue to be hostage to the OPEC cartel, and we will have greatly increased prices—for what?

There are a number of other questions which I believe should be asked and answered before we in the Senate are called on to cast a vote for which tax plan, if any, we will support. In reviewing the data provided by the Administration and various other sources, a number of important issues are unclear, and I hope that our witnesses today will be able to provide suitable answers.

A few of the more critical questions include:

How much extra production will result from decontrol? Will it be 500,000 gallons per day—CBO, or 1.5 million—DOE? How much conservation will there be? Using CBO figures, the marginal increase in oil which will become available because of reduced demand and higher production will cost American consumers \$107 per barrel. Is it worth it? How much will imports be reduced? What effect will a windfall profits tax have on production and consumption? What effect would a plowback provision have on production?

Another basic question I have is just what is the cost to the consumer going to be? I have heard Mr. Schlesinger say it will be \$80 per year, Senator Kennedy has said it will be \$300 per year, and others say it will be \$500. Originally, Mr. Schlesinger said it would cause a gallon of gasoline to cost another 4 cents. Just two weeks ago, he said it will cost between 5-7 cents per gallon more. That is nearly a 100% increase within a week, and the program has not even started yet.

It is absolutely essential that we be able to quantify the costs and benefits much better than has been done so far. And we must then communicate this information accurately to the public so that they will be able to judge just who, if anyone, is getting ripped-off or "plowed-under."

It is also my belief that both the costs and the benefits of decontrol should be as equitably distributed as possible so that no one part of the nation, or no one part of society will either bear more than their fair share of the burden, or benefit more than they are entitled.

Finally, we need to be absolutely satisfied that decontrol now is still necessary. We have seen how the oil companies profits have leaped ahead of last year's gains. Do they actually need the additional revenue to find that next incremental barrel of oil? Are we pursuing just more oil and gas, or are we truly seeking to expand our total energy base, and reduce our dependence on other nations?

Senator GRAVEL. I wonder if anybody is familiar with what the Mobil Oil Co. offers as a proposal. Can anybody speak to that?

Mr. FREEMAN. Yes, we are familiar with the proposal made at the Mobil shareholders' meeting last Thursday. To summarize it very briefly, essentially Mobil is suggesting that the windfall profits tax proposal be put aside and that the decontrol of oil products be concentrated on new oil found.

Thus the issue of incentive would be focused on new finding and new exploration. This distinguishes the oil already proved from oil already found.

From a business viewpoint Mobil's proposal sharply focuses the thrust of the administration's proposal with regard to a windfall profits tax on the issue of incentive to develop further domestic supplies. As such, I think it would be regarded by the investment community as favorable for oil companies with active exploration programs and consistent with U.S. energy goals.

Senator GRAVEL. There is one charge nobody has spoken to which is often repeated by oil companies who invest in other areas. At one time, one company was trying to buy Ringling Brothers Barnum and Bailey Circus, hotels, real estate, a department store chain.

Mr. FREEMAN. If I may, sir, say one thing. I would like to read into the record a response to your comment, something which appeared in *Fortune Magazine* about a week ago. The columnist was hypothesizing an imaginary press conference in which he was able to ask the question you just asked to the President of the United States, only he asked it in these terms:

Mr. President, you have recently referred several times to the need for laws or regulations that will force the oil companies to reinvest their profits in the oil and gas business and prevent them from using the money to buy department stores or circuses. We have also referred to the enormous profits that are being earned in the oil business.

Meanwhile, nobody is talking about enormous profits in the circus business. My question, sir, is why do you think we need regulations to force people to stay in oil if it is such a gravy chain?

I would say, sir, in dealing with our clients and assisting them, as investment bankers, any transaction which represented a diversification of investment out of oil, required a judgment by management as fiduciaries to protect the invested capital of their shareholders. Threats to the future profitability of oil required them to place small percentages of their capital in other industries. In the last 2 or 3 years, it has been no more than 5 percent, according to our calculations of total capital expenditures.

Senator GRAVEL. Thank you.

Mr. CARLSON. If I may refer the chairman to my testimony, page 19, we have the figures he is referring to, the small proportion of investment that has occurred outside the oil industry. Also referred to is the fact that those investments have never brought down those investments in relationship to income. They have always exceeded income.

You are talking about a small amount, not really taken from income, because the amount of income, even more than the amount of income they have received, went into investment in their own industry.

Even these figures are overstated, because it does not take into account the investment in other oil companies that the data could not sort out. It only took into account of investing in their own companies versus investment in other companies.

Senator GRAVEL. Thank you.

Feel free to join in on any question if one feels he can add something.

Senator Chafee.

Senator CHAFEE. Thank you, Mr. Chairman.

I found the chamber testimony, on page 1, very discouraging when you say we expect decontrol to increase U.S. energy production by the equivalent of 1 million barrels a day by 1985.

Now, as I understand it, we are using 18 million barrels a day in the United States and importing 9 million. So to increase, to go to decontrol and thereby increase U.S. production by 1 million barrels a day seems to me to be a very modest achievement.

My question to the other members of the panel, particularly those from Salomon Bros, who testified earlier, concerns the idea that greater profits means greater exploration; greater exploration means greater production.

How do you square that with production only going up by 1 million barrels by 1985, 6 years from now?

Mr. CARLSON. I would be pleased to start the conversation. I frankly see that one-half of the return from decontrol being increased

production, a little more than half coming from additional conservation. That is a rather significant increase, to have production provide 1 million barrels a day and conservation provide 1.2 million as early as 1985.

As you allow more time to occur, you have more of a chance for people to bring additional production on line. Also taking into account that this is conservative compared to some of the other testimony, because it assumed that OPEC prices would only go up with world inflation and not faster.

Of course, during the last 5 months, we have seen that that assumption would not likely hold in the future.

Mr. COPP. Senator Chafee, in response to your question, let's go back to the comments we made about oil being added given recent investment activity.

In the first place, you are raising the price of oil in conjunction with the recent rise in the price of natural gas. To the extent oil and gas are joint products, you have to look at the net increase in production of both on an oil-equivalent basis and perhaps look at the conservation effects on the same basis.

In the process on the demand side, there could be some substitutions away from oil to gas.

Recent past experience in terms of productivity of investment by the petroleum industry indicated on page 10 of our testimony suggests that 1.3 billion barrels of crude oil were added to U.S. oil reserves and, in addition, 10.6 trillion cubic feet were added to proven gas reserves.

Combine that together and you get an equivalent of 3.6 billion barrels of proved reserves added.

We suggest that the response mechanisms on supply are a little higher when you look at the numbers on an oil equivalent basis. At the same time, when you factor in the equation on conservation, I believe, as Professor Forrester has indicated, we might possibly be underestimating the direct and indirect impact of the higher energy prices.

In turn the positive impact on our economy of adding to supply becomes enhanced because of substitution of domestic oil equivalent for foreign oil.

Senator CHAFEE. Do you agree that decontrol would only add a million barrels a day by 1985?

Mr. COPP. No, sir. I do not think you can be that precise about it. I think we are more optimistic if you look at more recent productivities and assume we can be as efficient in the past as perhaps in the future, which may be a questionable assumption because of the rising cost of finding oil and gas. It really depends on what this administration is going to do in terms of allowing higher oil revenues.

If you are talking about total decontrol without tax, that is one response. If you are talking about decontrol with tax, you will get a lower response in terms of investment.

Senator CHAFEE. Dr. Carlson assumed that we expect decontrol to increase U.S. oil production by the equivalent of a million barrels per day. That seems modest to me; for all the huffing and puffing and work we are doing to only achieve that, percentagewise, it is a 10-percent increase in domestic production.

Mr. COPP. It depends on whether he means decontrol with the tax by the President, or decontrol without tax? I think you would get a



much higher response without a tax, as indicated in our paper; you would get a much higher response in terms of capital spent looking for oil which infers, given past productivity on investment, higher yield in oil capacity and perhaps oil equivalents added to proved reserves.

Senator CHAFFEE. I am not sure what your answer is. You think it would be perhaps more, is that it?

Mr. COPP. Yes, sir.

Mr. CARLSON. To show the comparison, the figure I gave was production. The figure on reserves that was just given was given at 8 years at a million barrels a day, so the difference here being reserves in the ground and how soon do you get them into the production process? That takes some time, so that would be the comparison between the two.

Senator CHAFFEE. The next question I have, on page 10 of your statement, Mr. Copp, you point out that in 1978, it was one of the most active drilling years in U.S. history and oil reserves were discovered. Now it seems to me that the opponents of your proposal of no tax would say, what are you complaining about lack of incentive?

Apparently there is enough incentive under present controls to make 1978 to be one of the most active drilling years. That seems to contradict the prior testimony we have. The first testimony of Mr. Wallace, indicated that there is an abundance of surplus of oil drilling equipment. He said, "The market is soft," I think.

Mr. WALLACE. I think I said drilling was down some 20 percent since the 1st of the year, primarily due to uncertainty about government energy policy.

Senator CHAFFEE. Yes. Let's stick with Dr. Copp. Here we have had had all this activity in 1978. Apparently there is incentive there, is there not?

Mr. COPP. There certainly has been incentive in the area. As I indicated before when you are drilling for oil, sometimes you might find gas. The surge in drilling that occurred, I believe, in 1978 to a large extent followed on the heels of higher prices for natural gas. This is borne out by the fact the average depth of wells drilled during this period tended to increase overall for new, exploratory wells; it indicates that oil producers, in response to higher gas prices, were trying to find gas because gas is generally found at deeper depths than oil.

This, to a large extent, explains the surge in drilling activity.

Now, to carry the question to the next step, you say, why is the rig market soft today?

I would submit that there are two very good reasons right now that it soft both of which indicate that the price mechanism works in hydrocarbons. By raising the price of new gas greater resources were allocated to look for gas and in turn a lot of rigs were built to accommodate the higher spending levels. The fact is, we found a lot of gas. Indeed, we have a slight "bubble" in gas supply.

This gas is attempting to find outlets in interstate markets. At the present time, it will take awhile to do so, depending on government policy on industrial uses of gas.

However, on the other side, uncertainty with respect to domestic oil prices and how much of a return producers will earn has been a factor contributing to the caution and slowdown in the rate of drilling activity in certain areas.

Most of the soft rig condition, onshore, is due to the gas bubble condition. You have wells in Oklahoma and Kansas producing at 20 percent of capacity. All this indicates to us the response of supply to price. Our argument is that if you allow higher oil and gas prices, you will get more reserves of oil and gas.

Mr. FREEMAN. Senator, perhaps it is not necessary to dwell in excessive length on the fact that even under the current complicated regulatory apparatus, new oil is the most favored oil and therefore, the incentive is still to drill and to find that new oil.

Senator CHAFEE. Thank you.

Senator GRAVEL. Dr. Forrester, would you like to make a comment?

Mr. FORRESTER. I agree wholeheartedly with the importance of incentives in the next decade for the production of more domestic oil and gas. I believe these hearings, the public press, and most of political discussion underestimates the potential for solving the energy problem through energy efficiency and energy conservation.

It will only be if we take some steps to raise energy prices to the consumer that we will get decisions for turning off lights when they are not being used, doing a reasonable amount of car-pooling rather than having so many automobiles on our highways carrying only one passenger, and also beginning to put in the capital investment that will save energy.

I have been looking at figures recently on conservation. Also, I have been talking to a very large financial institution that has billions of dollars available to invest in conservation activities because they think it will pay off when the energy price gets up to the level that it ought to be.

And there are technologies that will save a tremendous amount of energy. Home heating by the burning of oil is tremendously inefficient in many of our localities compared to the energy efficiency of a heat pump. A heat pump requires capital investment. Although a homeowner tends to prefer a fuel cost even if continuing over future years than a present substantial capital investment, this is a matter of incentives and some major changes in energy consumption can be accomplished without adversely affecting our standard of living or the effectiveness of our economy.

I think we are so underpricing energy that we simply are not producing the incentives toward either outright conservation or the efficient use of energy. And even with the present situation, energy is not significantly different in real terms from what it was in 1955. Energy went down and it has been coming back up in price, but it has not yet gotten a great deal above where it was in 1955, when inflation is taken into account.

Looked at another way, we do not pay any more for a gallon of gasoline today than we pay for water if you go to the grocery store and buy spring water for drinking.

Energy is absurdly inexpensive and as long as we have such a distorted incentive structure, we are going to be paying out to foreign producers a tremendous revenue stream that we do not need to.

Senator GRAVEL. Senator BAUCUS.

Senator BAUCUS. Thank you. I believe Senator Boren is under a time constraint.

Senator BOREN. I really appreciate that, Senator Baucus.

First of all, I want to compliment those who have testified this morning for helping to bring this issue into focus. I could not agree more with some of the comments that Professor Forrester made here when he said that in comparison to the task in front of the Nation, the so-called excess profits tax is merely a diversion.

I would further agree with your statement that the whole discussion and focus unfortunately has been a matter of political expediency rather than a fundamental approach to the energy challenge facing this country.

We have heard talk here about ripoffs. We have heard a lot about the ripoff of the American consumer. To me, the biggest ripoff of all would be if we asked the American consumer to pay a substantially higher energy price and then get absolutely no more energy production in return. That would really be a ripoff and a sacrifice of American consumers. If we take away in taxes what the consumer pays, we are not going to get any more energy in return, and we will siphon off capital which is badly needed to get more energy. The more we take that higher price away and put it into something that will not produce more energy, the more we are ripping off the consumer.

I believe that the people of this country are smart enough to know that if we just use higher gasoline prices as an excuse for higher taxes which do not provide more energy production, it would be the biggest government tax ripoff of the American consumer that ever occurred, and a very unfair one, in terms of the sacrifice that was to be made.

Let me follow Senator Chafee's question. Let's use some rough figures here. We are at 19, let us say, close to over 19 million barrels per day consumption—let's use 18 million as a round figure. Nine here and importing nine.

Using the examples given in the Chamber's testimony, if we have an increase in production by a million barrels a day domestically, we could reduce that 9 coming into 8. We would increase the domestic from 9 to 10.

Then if we had an increase of conservation effectiveness, another one point something in simple numbers, we would end up at the end of this period of time, 1985, producing 10 million barrels a day here, and importing 7, which is better than 9 and 9.

I think what Senator Chafee is saying, is "I sure wish that we could do a lot better than this if we are going to go through all this effort." What if we want twice the effect, producing 12 here at home, in equivalency and importing only five. It may not all be oil, it might be shale; it might be liquefaction. It might be alternate sources of energy. Or say we wanted to have four times the effects or three times the effect and virtually end our dependency, reaching energy independence over 15 years altogether.

It seems to me that there is only one way to do that. We must generate more capital. I think Senator Chafee's arguments are very good and this proposal does not go far enough. It does not generate enough capital in this country. That decontrol alone does not go far enough to produce all of the energy we need, is certainly not an argument in favor of the windfall profits tax. Quite the contrary.

What it is saying is that we are not generating enough capital by decontrol, with or without a windfall profits tax to develop all the

energy we need in this country, If you want to drill for oil or develop synthetic fuel, it takes money. Let us suppose that we want to reach this goal and have twice the effect of the decontrol plan proposed by the President with the tax. Let us say by that 1985, instead of having a million barrels per day produced here and a 7 million imported we wanted to go to 12 or a 13, domestically produced and are only importing 4 to 5 million barrels imported.

What, in terms of dollars, would that take? in other words, how many additional billions of dollars of capital over and above the present would be required?

I think we should be honest with the American people. We are going to have to raise capital to produce all the forms of energy and have more effective conservation. That costs money, too.

It costs money to build mass transit, improve homes and buildings and all the rest of it.

Can anybody give me an answer to that? I think that is what we ought to focus on and not waste the time of the American people calling names. We ought to see how much capital we need and who can most effectively use it. I believe that the private sector can. Who in the private sector and who in the public sector can best use it and for what kind of research and development?

Mr. FREEMAN. My colleague, Dr. Copp, is calculating. I think it might be helpful to indicate one procedure which would help us, Senator Boren, reach that number.

If you can accept the rule of thumb finding cost which we have derived, and which we think it is a fair starting point, if you can understand that the managers of oil companies have got to, as the saying goes, manage the bottom line, and pay attention to profits; if you further understand that a dollar in exploration is a dollar less in profits, unless you have a tax offset, then given a certain profit level, and the cost per barrel of finding new oil, you could divide that into the number of tax relief dollars and come up with the number of barrels found with a given level of tax incentives.

Senator BOREN. We may not only be talking about oil, but liquefaction, or shale.

Mr. FREEMAN. Every corporation I know of is faced with the same problem, presenting a financial statement consistent with the objective requirements of investors. It could be an oil company; it could be any kind of other company. They would have the same question: to what extent would tax relief offset the exploration expense and protect the overall results of the company vis-a-vis the shareholders.

Senator BOREN. Let us say we are aiming, at the end of the century, at energy independence. With all forms of energy put together. How much further do we still need to go in increasing capital formation for the whole private sector in order to achieve independence over what the President's proposal would do?

Mr. FORRESTER. The country is underestimating the potential for capital investment leading to conservation. We are also underestimating the importance of capital investment for moving to energy sources other than petroleum.

We cannot domestically produce our needs for petroleum forever and cannot forever import problems without growing foreign exchange difficulty. Therefore, we are committed to adjusting to an economy that can be self-sufficient internally in energy.

We have vast coal reserves, I am pessimistic about shale—it seems that the technology requires energy equal to a barrel of oil to get a barrel of oil. But we have other possibilities for energy. I read the other day that geothermal energy is increasing at 18 percent a year. There are other possibilities.

Solar has a tremendous potential, possibly even for high-quality electric energy, if there is a real incentive. If we, or somebody else, tax petroleum high enough—if we do not do it, OPEC will—there will be a price umbrella sufficient for the development of other kinds of energy sources.

There is no shortage of either managerial skill or financial capital to go into new energy ventures, if there is the potential for recovering the investment. It will take a lot of development. It only requires the reassurance that if one succeeds, he will be adequately rewarded.

I believe the energy problem is solvable about 50 percent through new energy sources and 50 percent through conservation and efficiency.

Senator BOREN. I apologize for asking for a figure but this is the kind of thing Congress ought to spend its time trying to figure out. On the order of magnitude, how much total capital is it going to take? To what sources should we distribute this capital so we can reach independence?

Is it safe to say if we had decontrol with no windfall profits tax, we would still fall short of independence including all energy sources? Would we need three or four times more capital generated by the year 2000, on that order of magnitude, over and above the President's plan? Would that be fair, or would it be double?

Mr. FORRESTER. The people I talk to suggest that a lot of secondary and tertiary recovery is possible. There is active debate about the possibility of huge gas reserves. We are never going to know, unless there is an incentive to try.

The figures suggest that most of the so-called exotic energy sources, solar and so forth, become attractive when energy reaches \$30 a barrel of oil equivalent. When we put energy prices up, there will be a reason to develop other energy sources. I am convinced we would get new energy sources more quickly and more efficiently through market incentives in private enterprise than by putting the money through the Department of Energy.

Mr. COPP. Senator Boren, there are various ways you can approach answering your question. Your question, in effect, is asking what is the investment yield at higher levels of investment in terms of oil and gas? At the same time, looking over the next 5 or 6 years, you have to keep in mind you are not talking about the cost of funding oil as being a constant, or the cost of developing as a constant. There tends to be a tendency in some studies to take as a beginning point a given figure of cost-of-finding oil as a constant, and calculating the investment requirements over time on that basis. That is completely inaccurate and it is because of the uncertainty as to what the mining costs in the future might be that contributes to the uncertainty of investment yield.

We are looking at more costly areas, areas we have no experience in, no cost data in some of these areas, no cost data on drilling on a massive scale in a number of wells, maybe a doubling or tripling of effort, at depths of 20,000 to 30,000 feet.

In that sense, we are talking about the unknown. So to say that if I spend three to four times this amount of money, I would get three to four times this amount of oil?

Senator BOREN. I do not mean just oil.

Mr. COFF. And gas together. It simply cannot be done with any degree of precision.

If you use the rule of thumb we have developed in our paper, at least in terms of the revenues of \$16 billion that would accrue to the companies, for example, will add to supply and help to reduce imports a little more.

The expected big gain is really in new oil. That is where the big response is going to come. We can spend so much time, I think, in the press and other places talking about this interim period of 2 years when we have forgotten the fact that the oil business and the gas business is one of long returns. Needless to say, look what happened in Alaska. We found in 1968-69. It was 7 or 8 years later before it finally got to the market.

I believe Mr. Chafee's question relates to when can we get these greater volumes of oil into the market where it then begins to back out foreign oil. Considering the rising costs of finding and producing and perhaps new policies in the Government, that we cannot predict those developments with precision right now.

Senator BOREN. Thank you.

Senator GRAVEL. Senator Baucus.

Senator BAUCUS. Thank you, Mr. Chairman.

I am sorry. I did not quite understand your collective answer to the question; I think it was what different incentives are necessary to double American production above 1 million barrels a day to 2 million barrels a day?

Mr. HAMMAR. I would like to say from our analysis of the past, on the traditional oil and gas exploration industry, there has been a relatively constant relationship between the money spent in constant terms and the results of that effort in barrels of oil and gas.

The problem with the calculation is such that barrels of oil are still the same, 42 gallon barrels that we have had throughout history.

The dollar side, on the numerator side, tends to reflect other aspects of variables, inflation and otherwise.

If you will take 10-year segments—I think we have done that—you will find the relation between the two are reasonably constant. There is no absolute law that this goes on forever when you have a finite source.

But I think, given the revenue, given the incentive and given the cash flow, the money will be spent and that oil and gas will be found.

As the price gets higher, other sources will occur and other energy supplies.

We, incidentally, Mr. Chairman, mentioned John Winger. My first association with the publication in the bank came in 1955 when we estimated capital requirements of the industry for the next 10 years. And the number, which is indelibly impressed in my brain, was \$150 billion, which, in all our minds, was a factor of three times, I think, three to four times what had been spent in the previous 10 years. It all impressed us as a number that is economically and realistically unattainable.

In retrospect, we went back and found that the number, for various reasons, was essentially—the closest assessment I think we ever made, \$114 billion.

The point is, in looking ahead, the numbers tend to loom large in respect to the kinds of numbers we are using today, thinking that today. Nonetheless, the effort has to be made and the results of that effort will be what the results will be.

But it has to be an additional supply of oil and gas as well as involving other technologies. I think that the history of the industry has been that estimates ahead tend to be conservative; that once somebody decides to go into a new area or try something new, the results of that, as technology develops, tends to be more productive than what we thought previously. There is a natural tendency.

So, for that reason, I think that when you asked about what might happen in a given year, again was mentioned, the time lags are tremendous; it is difficult to say. But I think a direction could be established, and the direction could be up. If it is a million barrels or more and rising, this has an effect on the economy of our country as well as the attitude of OPEC and others that we have established a direction that is positive and the effects are becoming apparent.

Senator BAUCUS. Dr. Carlson, your statement, conservation increases as imports reduce, is that entirely with redegulation, but also assuming the President's tax?

Mr. CARLSON. Deregulation by itself. The windfall tax would reduce the production side from domestic sources. Consequently there would be more imported oil than if you had straight decontrol.

Senator BAUCUS. I take it, then, that all of you on the panel are not in favor of any tax along with the proposal of deregulation?

Mr. FREEMAN. Senator, if I may address myself to that, we started out by talking about objectives. If the objective is to maximize the rate of new energy production in the United States in the shortest possible time period at the least cost, we have found no credible alternative toward continuing to fund adequately the exploration programs for oil and gas in the United States by companies who have proven that they can find it.

On that basis, to the extent that the tax would have an inevitable downward effect on the money available for exploration, the question then becomes will the diversion of those dollars to Government coffers produce more energy faster at a lower price.

Senator BAUCUS. Do you recommend any actions in the other direction? You agree that there should be no tax. What additional incentives do you recommend?

Mr. FREEMAN. If you have before you the financial data which accompanied our testimony, you will see that the first two lines pertaining to cash flow and capital expenditures tend to track one another pretty closely. Indeed, on the average, a company spent \$1.13 for every dollar of retained cash flow.

Putting myself in the position, if I may, of a policymaker at the government level, I would want to be sure that cash flow grows fast enough for exploration programs to develop new reserves.

When the efficiency of the exploration starts to decline as evidenced perhaps by a sudden extreme rise in the cost of new reserves, you might think again about redirecting those dollars to somebody who can find new energy faster and cheaper. But until that candidate emerges, this looks like the best bet.

Mr. FORRESTER. We make a mistake in trying to dig into the facts rather than the process because the facts are very slippery. The average cost of exploration will vary 5 to 10 to 1 depending on the skills used in applying the money.

Estimating dollar values is helpful background, but it is the social and technical process we ought to look at. The present process tells us that there are not enough incentives to produce energy and to save energy and therefore we are led into our present difficulties.

The correct program is to devise a process—I made a suggestion in my testimony—that keeps increasing the incentives for more petroleum, for more energy from other sources, and for efficiency and conservation, until an energy balance is reached.

Conservation is not using energy you would like to use. Efficiency is getting the same result with less energy.

So the emphasis, I think, should be on the process of raising incentives until a balance is struck.

Therefore, to raise the incentives for efficiency and conservation and for oil production and for production from other energy sources, the only thing that we will reach into the billions of decisions that involve the use of energy and the hundreds of thousands of decisions that involve the production of energy, is going to be something that people understand in the way of pricing and profits. The Government just cannot reach into all of those details. It is literally impossible.

We ought to focus on the process rather than on the figures, which are slippery at best. Even the people who generate the figures are not sure of them. They have to be tried out in practice before one can know. They cannot be settled by debate. We need to go down the road of generating incentives that affect what everybody does.

Senator BAUCUS. I think that is correct.

I am struck a little bit with the presentation this morning in that it seems to be confined pretty much to the oil industry not to oil conservation, other forms of energy. Also, the testimony tends to be somewhat applied to the near term, the 1980's and the 1990's.

Senator GRAVEL. I think that was our fault. When they were asked to testify, we asked them to testify on the President's proposal.

Senator BAUCUS. I understand that. I was curious, nevertheless, to what degree any of your conclusions and recommendations might change assuming the scope of the kinds of energy production that might be available, and also the long-term savings in 15 or 20 years.

It seems to me if—I am not saying that this is true, but if—decisions made today are focused only on petroleum and only on the next few years and if we are able to, in some way, ascertain what we should be doing if we broaden the scope, to me if there is a divergence between the two, we should ask ourselves to the degree we can how our present analysis may change or broaden the scope.

Mr. FREEMAN. Senator, perhaps this is a partial answer to your question. Our firm acted as an informal adviser to the Department of Energy for the solvent refined coal process which the Department of Energy was extremely enthusiastic about. We were looking forward to a 10-year timeframe with the active cooperation of electric utilities and one oil company producing and testing this fuel.

Unfortunately, budgetary constraints caused the program to be canceled, and the efforts are now stopped. I think we are now faced with the problem of transition.



Whatever we are able to work out, whether it is wind or tide power, solar power, or any of the various technologies that we have heard so much about, and some of which are now in the pilot stages, we still have the problem of getting from here to there. And, having been in a situation last winter when our house was out of oil for 2 days, my wife's complaints seemed to go on forever. Those 2 days were very, very long. We are concerned with transitions.

Senator BAUCUS. It is complex. I am bothered by two points. We should begin to be thinking about other resources. Second, I am a little disturbed that deregulation seems, in the short term, to be at the whim of OPEC. The deregulation which will be the market price, which will be the OPEC price. Is that a correct assumption?

Mr. CARLSON. Yes.

Senator BAUCUS. Do you see any problems in taking the market price as the OPEC price?

Mr. CARLSON. I think we have focused on crude oil, but all energy prices are going to be affected by the decontrol that occurs in the United States. Coal will, too. You are having a repeat of Federal price controls impacting adversely on the economy again. Again, in Appalachia as you did at the end of the fifties and sixties when we had price controls on natural gas below what the market would provide and coal would have been produced in Appalachia. Consequently, we had recession conditions.

With crude oil prices being put up, coal is going to be more attractive and there is going to be considerably more investment in the coal and crude oil industry and any other energy sources.

It seems as though it will have a pervasive effect really, across all energy, not just crude oil that we have been talking about primarily today.

Senator BAUCUS. I understand that. I wonder what the ramifications are of having the market price as the OPEC price?

Mr. COPP. You have to remember, we are importing now 50 percent of our requirements. The bulk of this oil is high-quality crude oil. I think, if anything, the proposals on new oil by the administration of \$16 a barrel plus inflation are totally out of date and irrelevant for the kinds of crude oils and kinds of refining capabilities that we have in this country. Our refineries need, by and large, sweet crude oil of better quality. Yet we are comparing the difference between the foreign price and \$16 plus inflation, when in fact the landed prices today on the market, if you are going to buy a barrel of sweet crude anywhere in the world today, would cost you anywhere from \$20 to \$23 a barrel, which is well above what the administration is proposing as a starting point.

So, in effect, we are faced with a proposal that does not recognize the realities or requirements of the situation today.

It seems that the more efficient way to respond is to provide higher prices here quickly, suddenly, and in massive doses and not tax those higher prices and let the system work.

We saw the best example I could give of that in the gas situation where the system did not respond very quickly, rapidly, much more rapidly, perhaps, than some of the oil companies were anticipating.

The fact is, we have not tried it. We always talk ourselves out of allowing the price to go up to appropriate levels.

Mr. FORRESTER. The anomaly on this energy situation is the unusually low cost of production of oil in the OPEC countries. That gives us this peculiar political stress. If it cost them as much to produce oil as it costs us, I think a lot of political problems would go away. We would begin to realize that energy is simply becoming more expensive, that low-cost energy is a part of our history, not our future.

OPEC is testing our ability to produce energy. They are raising the price. They do not want to price themselves out of the market or they will be in trouble. They are testing our pricing system by their actions and we are giving the game to them through our actions.

Senator BAUCUS. I think that is true.

Could you give me a rough estimate between the production costs on an average basis that OPEC pays to produce compared to the United States?

Mr. FORRESTER. Some of my colleagues could give a better figure on that.

Mr. COPP. It depends on what country you are talking about. It is the same concept that exists in terms of higher cost incurred to get more oil. The production costs differ dramatically in Venezuela or Ecuador than they would in Saudi Arabia, Iraq or Iran. The low-cost producer is Saudi Arabia.

The production costs there on existing fields have varied anywhere from 25 cents to 50 cents, depending on location. With respect to U.S. production costs, they vary anywhere from \$2 to \$3 a barrel, and higher.

Senator BAUCUS. Thank you.

Senator GRAVEL. Senator Chafee.

Senator CHAFEE. I just have one question. I find the increased price does not necessarily result in reduced consumption. Certainly, as far as gasoline prices go, I think it may be true if you get to the dramatic increases suggested by Dr. Forrester's \$20 a barrel.

So far, there has been little indication that the American public and foreign automobile drivers, for example, really reduce their consumption because of higher prices.

That seems to be suggested also in the statement by Mr. Wallace and the Chase presentation, where you say on page 3, only minor import savings and decreases of oil consumption, can be expected to occur due to conservation.

And I suppose it is true, as was mentioned, that the increase in prices of gasoline has not been that dramatic with inflation and, of course, with reduced consumption. I saw a Ford's Co. survey indicating that you are driving 10 miles at less cost than you were in 1955.

That is, if you are driving a Honda Accord, or a car of greater efficiency than that.

I just came back from Athens. The streets are jammed with automobiles and gasoline is close to \$2 a gallon.

Do you agree with that? Of course, Dr. Forrester's cure would be far more severe and probably would work.

Mr. FORRESTER. There is a range within which price has a minor effect. That range, is where the price is low enough that it does not really matter. We are still in that range. Even yet, the cost of gasoline is a minor part of the cost of owning an automobile. But there is some place where price begins to matter.

While indeed there will be a lot of screaming as price rises, people demonstrate by their continued usage of excess energy that they do not care about price until it reaches the point where patterns of usage change.

Mr. CARLSON. Let me comment in terms of past studies. If you look at the changes we have had in the United States in the past, it is true that price increases do reinforce additional conservation by measurement, Jorgenson's measurements and others.

It is true it is not dramatic. For every 1-percent increase in price after 5 or so years, we get 0.3 percent of the quantity consumed.

While you are getting some benefit from the price increase, you are also having an income increase. When incomes go up a lot, our people use energy a lot more, and the sensitivity to an income rise in the use of energy is fairly close.

Consequently, the income rise is offsetting the price effect you have. If you did not have the price increase, your situation would be worse. So you take the benefits wherever you can get them.

The only alternative is to put people's incomes down, and they would consume less energy.

Senator CHAFEE. Let me try another one on you.

There is some suggestion that the OPEC nations can reduce their production as our demand for oil decreases, yet keep their prices constantly high—no matter how much they sell us, their gross would be the same.

In other words, the Saudis, for example, could turn down the tap, increase the price, and they would come out the same, and save their resources for the future. That seems to me what is happening.

Mr. COPP. Senator, that is true. If you run the numbers, you can generate 2 revenues at 8.5 million barrels a day f.o.b. price at \$14.545. Reducing that to 6 million barrels a day, and raising the price accordingly can generate the same total revenues that is because of the current sellers market in oil and the inelastic demand for oil.

However, there are very few countries in OPEC that could have the luxury of reducing their production on a long-term basis, with the exception of the Saudis, Kuwaitis, and perhaps Abu Dhabi. None of the other OPEC countries are in a position to reduce production deliberately in size because of their requirements within their own countries for funds for their own economic development programs. They require even greater revenues to provide for the programs they have established for their countries.

Senator CHAFEE. That is the question. If they can increase the price, they come out the same.

In other words, if the Venezuelans reduce the amount they sell but the price constantly goes up, they are just as well off.

Mr. COPP. Even with higher revenues many of these countries are still in the markets borrowing money to have the funds required for their total needs.

Senator CHAFEE. For example?

Mr. COPP. The Indonesians, Algerians, Venezuelans, Ecuadorians, the Nigerians—

Senator GRAVEL. The Saudis have a problem, too.

Mr. COPP. The Saudis are a different situation altogether. They had a drawdown of foreign exchange in the first quarter of last year, a temporary phenomenon that corrected very quickly.

Mr. FREEMAN. Subject to those details, you are absolutely correct. They are in the catbird seat, determining unit prices, in the type of petroleum market we now have. That market seems to be getting tighter.

We have looked at these elasticity studies, and reasonable men can reasonably disagree about their funding. It does not look like there is a whole lot of price elasticity. We are saying, hedge your bet. Let the price go up to market price. That will discourage some people from buying more energy than they really need; but reinvest those dollars in finding new energy. Do not divert them into other uses.

If you do, we may find ourselves with no elasticity and no new energy; the worst of both worlds.

Senator CHAFFEE. Thank you.

Mr. FORRESTER. Your statement about OPEC pricing is correct, as long as we leave ourselves totally at their mercy and discretion. If we maneuver internally so we do not compete with them, then they can set price and take whatever reduction in usage occurs, and they can do exactly as you say.

I believe we have open to us the ability to take away that initiative and to totally reverse the situation that you imply.

Senator GRAVEL. If they are functioning in a cartel, let them act like a cartel.

At one point, somebody gave a figure with the realistic situation in pricing of oil today that the impact of the present proposal is to take from the existing situation the \$1.70 in additional tax on a barrel of oil. Is that correct?

Mr. WALLACE. That is correct.

Senator GRAVEL. When the President first came out with the proposal, I was elated that we were going to see the regulation. In private meetings with people at the White House, I was surprised at the reluctance or lack of enthusiasm that we are going to deregulate. That is the solution. Let us go forward. None of that back up to that decision. In fact, just to the contrary. We are going to deregulate, and there was a lot of grumbling.

I was equally surprised with the rhetoric the President used in his appearance. I thought it was a great disservice to a part of American industry.

Now, as a result of today's testimony it is apparent that somebody thought of a plan within DOE and sold it to the White House. We have tried everything else. Rhetoric, at the time, calls for deregulation. In response we are presented a scheme where you can say it is deregulation, while, in point of fact, it is continued regulation of a more onerous kind.

I think, gentlemen, you have rendered a service to this committee. It is very sad that we have a house full of press and media when we had the administration spilling out, and had imperfect data. When we had documented presentations like this the quantity of press has substantially diminished.

I just want to commend you for your service to your country and to the Congress in helping the policy of this country, helping the intelligent policy of this country.

Senator Baucus.

Senator BAUCUS. Just one quick request, please.

Dr. Copp, you mentioned the difference in production costs that various OPEC countries experience compared with the United States. I wonder if you might provide for the record a complete set of records showing these production costs to the degree that they are available.

Mr. COPP. I am not privy to the production costs in all of the countries in detail, so that it could be totally useful. I could give you some rough guidelines from public sources that might be helpful.

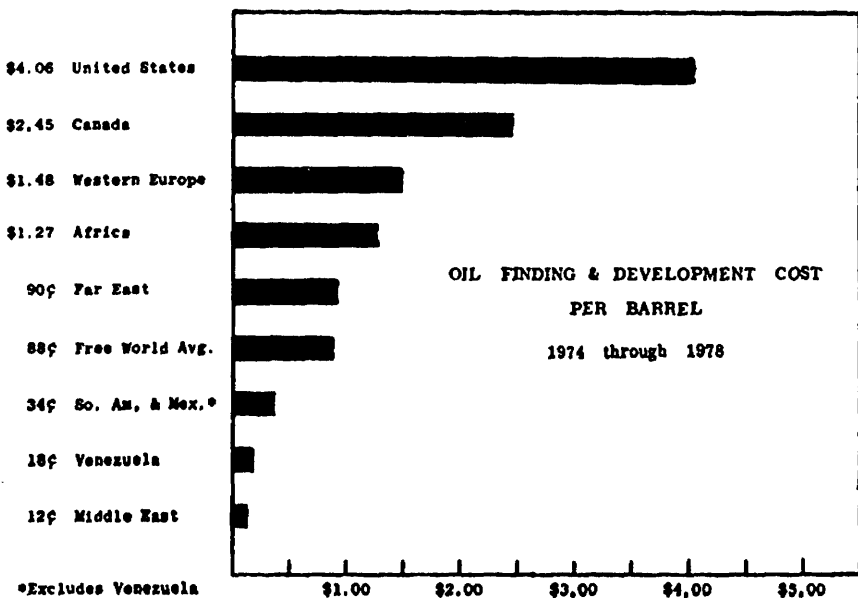
Senator BAUCUS. Thank you.

[The material follows:]

In response to Senator Baucus' request for information regarding the differing costs of finding and developing oil and gas in the Middle East and Far East versus the United States, I am providing some recent public estimates from May 1979 "Petroleum Outlook" report of John S. Herold, Inc.

Methodologies differ widely over estimating cost functions for specific countries. I would surmise that the previous 5-year finding cost in the United States is below the Herold estimate of \$4.06. Expected future finding costs, the relevant in these policy considerations on energy, are likely to be well above the \$4 rate.

The attached figure provides the Herold 5-year averages.



Source: John S. Herold, Inc.

Senator GRAVEL. Thank you.

The subcommittee stands adjourned.

[Whereupon, at 12:35 p.m., the subcommittee adjourned.]

## CRUDE OIL SEVERANCE TAX

MONDAY, JUNE 11, 1979

U.S. SENATE,  
SUBCOMMITTEE ON ENERGY AND FOUNDATIONS,  
COMMITTEE ON FINANCE,  
Washington, D.C.

The subcommittee met, pursuant to notice, at 9:40 a.m. in room 2221, Dirksen Senate Office Building, Hon. Mike Gravel (chairman of the subcommittee) presiding.

Present: Senators Gravel, Long, Boren, Dole, Wallop, Durenberger, and Chafee.

Senator GRAVEL. The hearing will come to order.

This is the third in a series of positioning hearings on the administration's policy with respect to deregulation and the establishment of an excess profits tax.

Our first witness today will be Mr. Charles Blackburn, executive vice president, Shell Oil Co., on behalf of the American Petroleum Institute.

Mr. Blackburn, please proceed.

Mr. BLACKBURN. Mr. Chairman——

Senator LONG. May I make this suggestion at the beginning? Put those charts up here so everybody can see them.

All right, sir. Go ahead.

### STATEMENT OF CHARLES L. BLACKBURN, EXECUTIVE VICE PRESIDENT, SHELL OIL CO., ON BEHALF OF THE AMERICAN PETROLEUM INSTITUTE

Mr. BLACKBURN. I am sorry to say I am not able to stay for the full hearing this morning. I have a series of appointments beginning at 10:30. I am delighted to be here with the time that I have.

We believe the administration's decontrol program is a significant and necessary step to move our Nation toward sound solutions of our most serious energy problems. The gradual removal of Government controls on crude oil prices will provide eventually many benefits to the American consumer and the American economy.

There is no doubt that additional petroleum supplies can be produced in the United States. Shell's assessment of the U.S. oil and gas resources, assuming continued improvement in technology and a favorable economic climate is shown in chart 1.

Total production of oil and gas in the United States to date represents about 50 percent of the total amount that ultimately will be produced. Of the remaining unproduced oil and gas resources, about 45 percent has been discovered and 55 percent is yet to be discovered.

We estimate that there are 60 billion barrels of oil and 305 trillion cubic feet of gas yet to be discovered.

In addition, we estimate that there are about 20 billion barrels of oil recoverable through enhanced recovery methods.

Phased decontrol will provide incentives and capital to stimulate more drilling and production. The historical record shows that every time there has been an increase in oil prices, there has been a major increase in drilling activity.

Chart 2 illustrates this historical relationship between the real price of crude oil and the number of wells drilled in the United States. During World War II, oil prices were frozen at prewar levels. When controls were removed in 1947, the real price of crude rose and as a result, drilling rose even faster.

From 1959 to 1972, the real price of crude oil declined and drilling declined even more. In 1973, the average price of oil turned upward because of the effect of world prices on U.S. prices. This price rise has stimulated increased drilling activity.

Senator LONG. Let me get this straight. At the rate that we are using oil and gas right now, how long do you think that will last the Nation, figuring in new discoveries and enhanced recovery?

We are using about 18 million barrels a day of oil and only producing half of our requirements. We are producing our requirements with gas, as I understand.

At the rate we are using it now, how long will that last the country, if we are providing our entire needs domestically?

Mr. BLACKBURN. And we do not discover any new oil?

Senator LONG. I am assuming you are talking about the oil you think that we can discover and the gas that you think can be discovered.

Can you give me an estimate as to how long we can last in this Nation and get by producing our requirements, if we can find it all and recover it all?

Mr. BLACKBURN. Yes, sir. Let me do a little quick arithmetic. Let us assume we will use about 20 million barrels a day because of increase in demand, 20 million barrels a day, somewhere around 7 billion barrels a year, or thereabouts.

We have reserves, as you can see there, of about 30 billion barrels of oil. We estimate future discovery at 60, enhanced recovery at 20, so that is another 80, or total of 110 billion barrels.

It would appear, then, on the basis of flat production, if we were to produce the full 20 ourselves, that looks like it would be somewhere around 110 divided by 7, 15—15 to 20 years.

Now, we are not producing 20 million barrels a day. We are producing 10. You can double the flat production. What will happen, of course, would be if oil could be gotten and produced over a longer period. It would decline slowly.

Senator LONG. At the rate we are using it now, it would last 15 years?

Mr. BLACKBURN. Yes, sir. If we produced it at that rate and fulfilled our total demand domestically, which we are not capable of doing at the moment.

Senator GRAVEL. It would be 30 years.

Mr. BLACKBURN. We are only producing half of it.

Senator GRAVEL. Thirty years.

Mr. BLACKBURN. At our current rate of production.

Senator GRAVEL. If we did not import another drop, if we maximized production.

Mr. BLACKBURN. We are not capable of raising our production at the moment. Ten million is all-out. That is as high as it can be at the moment.

We have no shut in production.

Senator LONG. You think about 10 million barrels a day is as much as this industry is capable of producing here—that is, oil?

Mr. BLACKBURN. Yes, sir. I do.

What we think will happen is without any exploration of new oil that the production rate at 10 million barrels a day will fall to something less than 5 million barrels a day by 1990, with no new activity of any kind. It will go from 10 to 5, a natural decline.

When we talk about adding through new exploration and development, we are talking about arresting that natural decline. Keeping the production flat.

Senator LONG. How about natural gas?

Mr. BLACKBURN. Natural gas is forecast—again, with the activity and production relatively flat, again the decline would be such without any new exploration and development that natural gas production is going to fall to less than half of what it is now, more rapidly than oil.

Senator LONG. Suppose you provide incentive. What do you think the incentive should be?

How long could we produce our requirements of natural gas at the rate we are going?

Mr. BLACKBURN. Well, we foresee that we are going to be able to keep producing natural gas at least in the timeframe that we are capable of forecasting, through the end of the century.

Senator LONG. Through the end of the century?

Mr. BLACKBURN. Yes, sir. Through that period because the demand itself somewhat adjusts to the supply. There has been some switching—people switching from natural gas to coal, switching from natural gas to fuel oil. There has been some adjustment.

Senator LONG. Thank you.

Mr. BLACKBURN. While it is impossible to calculate how many additional dollars will generate how many new barrels of oil, one thing is certain—the supply of crude oil is positively related to price.

I might go back to the previous chart. I do not think I mentioned it. You can clearly see that since 1973, the average price of oil turned upward. You can see the effect on drilling activity very clearly on that chart.

Chart 3 shows Shell's forecast of increased domestic oil and gas production, if all crude oil price controls were removed as of January 1, 1979, compared to production under continued controls. This is comparing the situation of removal of controls with the situation that exists today. We will continue to explore for it, and develop, with what exists today. This is the input over and above that, with the removal of controls.

Volumes are expressed in millions of barrels of crude oil equivalents per day.

This chart indicates that the production response to crude oil price decontrol to be around 1.5 million barrels per day by 1985 and continuing to grow throughout the forecast period.



This forecast assumes instantaneous decontrol and reinvestment of the incremental revenue due to crude oil price decontrol. With phased decontrol as proposed by the administration, the production response will be significantly less—approximately 600,000 barrels per day in 1985, less than half of what is potentially available to the Nation.

Chart 4 presents an historical pattern of reinvestment for the oil and gas producing industry. This chart shows clearly that industry activity is responsive to incentives and cash availability, since investment—as a percent of cash income—has been maintained at a high level since the price increases of 1973.

In Shell's own case, in the decade of the 1970's, we have increased our reinvestment in our exploration and production business from some 70 percent, up to 90 percent of our available cash.

Senator LONG. What is the CIAT?

Mr. BLACKBURN. Cash income after tax. What is really available to us.

Senator LONG. That is a very important thing.

Mr. BLACKBURN. Not revenue. Cash income after paying expenses and after paying taxes.

A dramatic example of the reinvestment process is Shell's Cognac platform. In 1978, Shell, as operator for a group of producers, completed installation of this platform, which is the world's tallest at 1,100 feet, and heaviest, at 51,000 tons, steel drilling and production platform, in the Gulf of Mexico. This one project represents an investment of nearly \$800 million.

I might say, our ability to estimate is not particularly good. When we first thought about Cognac, the prospect, we thought the platform might cost us somewhere about \$60 million to \$75 million. When we originally approved the project, after acquiring the leases, the engineers scaled that estimate to about \$130 million. When we finished building it, the final cost turned out to be \$265 million. So we experienced a little bit of shortsightedness in our ability to estimate costs.

If one were to disregard the highly significant considerations of national security, national economy, and international balance of payments, there would still remain a further important aspect. This is the specific cost trade-off of imported oil versus domestic oil and gas production. Thus the question is posed: What does the volume of production added by decontrol cost the economy as compared to the cost of importing that same volume?

Chart 5 shows the incremental cost of increased domestic supply resulting from crude oil instantaneous decontrol as compared to importing an equivalent volume of oil.

I might add that this study was made before the recent surge in OPEC prices.

The panel on the left shows the specific cost trade-off of imported oil versus domestic oil and gas production on an annual basis. The revenues retained by the private sector—exclusive of payments to governments—resulting from decontrol of crude oil prices and associated incremental oil and gas production, approximate the economic cost of the incremental domestic oil and gas production on a current expenditure basis.

Alternatively, equivalent crude oil volumes could be imported at world prices. Initially as the incremental domestic production would be quite small, it would be cheaper—on a current expenditure

basis—to import equivalent crude oil volumes rather than pay domestic producers decontrolled prices.

However, the annual payments for imports would exceed the current economic costs of the same crude oil equivalent volume of domestic oil and gas production resulting from crude oil price decontrol after 1984.

The public would be paying more early on with decontrol than they would if they were importing it. After 1984, they will be paying less as we build up domestic supply. That is what that panel shows. The bars on the left show what the public pays the oil company, you might say, and the alternative, the black bars, importing from OPEC nations.

The right panel uses the same basic data as in the first chart, but shows the cumulative difference between the costs. In other words, the plot reflects the cost of imports—black bar—less the cost of domestic supply—white bar—on a cumulative basis.

You can see, we go farthest in the hole by 1984. After 1984, we are paying less for domestic than we are imports. After 1986, it looks like we are positive and as we go into the 1990's we are very positive, as a result of the decontrol situation.

Senator GRAVEL. Why?

Mr. BLACKBURN. Why?

Senator GRAVEL. Why?

Mr. BLACKBURN. Because 1.5 million barrels a day generated domestically from instantaneous decontrol will cost the public less to find and develop than the alternative of buying the 1.5 million a day from foreign countries. That is what that curve represents: The cumulative cost to the public.

It goes down to about \$20 billion by 1984. That is what it costs the public for us to develop our own production. After that point in time, it is cheaper to produce our own than it is to import it.

The annual outgoes and incomes are shown on the left.

Senator GRAVEL. Is this assuming an increase in import costs?

Mr. BLACKBURN. That was before the recent surge. The assumptions that went into imported oil at \$15.25 per barrel escalated for inflation from January 1, 1979.

Senator WALLOP. It does have a presupposition that you will be able to find and produce that oil.

Mr. BLACKBURN. It supposes with additional revenues, incremental revenues from decontrol, will be reinvested by the industry and that we will find 1.5 million barrels a day and develop it. Slowly, but by 1985, that will be the effect.

Furthermore, by 1990, in addition to having produced this 1.5 million barrels a day, reached that production level, we will also have developed about 5 billion barrels of additional reserves than we would have otherwise, and will have that as additional inventory.

It does presuppose that we will be able to find and develop an additional 1.5 million barrels a day. That is based on a study which is based on extensive historical statistics about drilling rates.

I have a report that I will file with the committee which is supportive of the kind of numbers that I am talking about here.<sup>1</sup>

Senator GRAVEL. Why would not inflation also apply to the existing oil that you discovered during that period of time?

<sup>1</sup>The report entitled "Economics of Domestic Crude Oil and Natural Gas Exploration and Development 1959-76" was made a part of the committee file.

Mr. BLACKBURN. It would apply. We have assumed it would. We have assumed that the industry would sell the oil it discovers and produces at world prices, the same price assumptions as the imported oil.

The industry revenues would be based on receiving world price, and that the increment over and above the control situation we are in now would be fully invested in this activity.

Senator GRAVEL. All right.

Mr. BLACKBURN. The result of this crude oil decontrol would reach an order of \$30 billion positive by 1993, the last year of this analysis, and should continue to grow. Very importantly, by 1993, there would be 5 billion crude oil equivalent barrels of additional domestic oil and gas developed reserves, over and above the present situation.

At this point, I would like to say a word about the profitability of the oil industry as compared to other industries. Chart 6 compares the oil industry net income, expressed as a percentage of stockholder equity for the 10-year period 1968-78 with other industries. As can be seen, the rate of return for the oil industry is in line with total manufacturing and below other major industries.

In addition, a very definitive analysis has been made of the domestic oil and gas industry. I have a copy of the analysis. It is labeled "Economics of Domestic Crude Oil and Natural Gas Exploration and Development, 1959 to 1976." The data sources are listed in the report.

We can authenticate this even further. We have a number of appendices and additional backup material that can be provided if you feel it necessary, to your staff.<sup>1</sup>

Senator GRAVEL. We would like to have that.

Mr. BLACKBURN. Yes, sir.

Mr. BLACKBURN. I would now like to talk about the windfall profits tax. I am opposed to such a tax because Treasury's own figures indicate that governmental entities would receive some 50 to 60 percent of each additional dollar from decontrol without any additional taxes.

Further arguments that a tax is necessary because the industry will not use the revenues for additional energy supply are not supported in fact.

The tax also ignores the sound business principle that revenue should at least equal replacement costs. It is this last fact that makes the tax counterproductive, because for each additional dollar paid to Government in additional taxes, there is one less dollar spent on expanding domestic supply.

Furthermore, each domestic barrel of oil that is not produced because of insufficiency of return to the producer represents an additional barrel of oil purchased from abroad, and even though the price paid to the foreign producer might have provided sufficient deterrent for production from domestic sources.

In other words, we would be in the position to be willing to pay a foreign producer a price that we would be unwilling to pay a domestic producer, even though that choice is detrimental to our balance of payments and is otherwise punitive against our own economy.

<sup>1</sup> Material attached to prepared statement of Mr. Blackburn.

Mr. Chairman, I do not believe that there are any so-called unearned profits. Those who calculated potential windfalls have lost sight of the fact that average statistics do not adequately describe the situation in the oil field. A tax that seeks to promote someone's idea of equity would, in fact, severely penalize wells in the stripper category, marginal wells, and enhanced oil recovery projects with high operating costs.

Furthermore, the concept of subjecting newly discovered oil, which is oil developed at today's costs, to the so-called OPEC tax is tantamount to the permanent imposition of a domestic crude oil tax.

Continuation of control would do just the opposite of the direction that we should be going, if we are ever to achieve an ability to reduce our energy costs.

We must be taking every step to cause this country to be less dependent on imported supplies of oil. All domestic energy policy should be examined with this point in mind. Directionally, new taxes will increase our dependence on OPEC.

To sum up, decontrol of domestic crude oil pricing will provide additional supplies of oil and gas. This will move our Nation toward sound solutions to our most serious energy problems and provide eventually many benefits to the American consumer and the American economy.

Thank you very much.

Senator GRAVEL. Could you furnish for the record, you gave us some figures showing roughly about \$70 million for that platform that escalated to \$265 million.

Do you have any statistical data showing the increase that you experienced in the cost of searching for oil?

Mr. BLACKBURN. Yes, sir.

For the industry, it is included in this report.

Senator GRAVEL. I do not know if you had a chance to see in this morning's paper the increase that was experienced with respect to synthetic crude costs?

Mr. BLACKBURN. Yes, sir. I read it.

Senator GRAVEL. And the charge by some that the companies just do not want to go into it because they are making more money in what they are doing now.

Could you comment on the first part of that article?

Mr. BLACKBURN. Well, there is no question that the estimates of producing synthetics have increased, the costs have increased. In our own case, I can talk about specific things.

We, at one time, bid and acquired in partnership with other companies a lease in Colorado for shale oil. We, along with our partners, paid some \$60 million for the rights to develop the shale oil.

A couple of things happened. The technical costs of doing it rose materially from our previous estimates. The environmental hurdles were insurmountable; that is the right word—the ability to get permits to do that project, to get past all the environmental restrictions and regulations. It turned out to be an insurmountable situation.

We subsequently surrendered our interest in that lease to our partners. We assigned it to them and wrote off our share of the \$60 million.

I think what that would say is that we had every resolve and every intention to get into that business. We found, for a couple of reasons, that we were not able to in that particular instance.

We are also involved in investing in some tar sands projects. These turned out to be in Canada where the major tar sands are. We are participating in a \$150 million steam drive in situ recovery project.

We are contemplating the participation in what will turn out to be in 1978 dollars, somewhere between \$3 billion and \$4 billion for 125,000-barrel-a-day tar sands mine.

We are still a part of a group of companies that are looking at it.

What I am trying to say, our desire to get into the synthetic business is strong. I personally believe that synthetics are going to be the longrun solution to many of our problems.

The costs have gone up.

The first time engineers do anything, they have a strong tendency to underestimate the costs. The costs have gone up, that is true—estimates of costs.

There is a concern that exists, of course, once you get these projects in, that OPEC will cut the oil price. There is that kind of concern.

I do not think the oil companies are holding back. There are a lot of other problems associated with this also. The conversion of coal to gas, environmental difficulties to overcome.

The shale industry has environmental difficulties to overcome.

I would like to make another point, one that I forgot to make earlier.

When we talk about the 60 billion barrels of potential resource in the long term, one of the points I would like to make is that half of that estimated oil is in our frontier areas, Alaska and the offshore of Alaska. We are not getting very rapid access to it.

The lease sale schedules we are confronted with do not give the oil industry very rapid access to the exploration and development of those potential Alaskan oil finds. It is conceivable that we have a Mexico situation. There is one lease sale area with high potential scheduled in the next 5 years.

Senator CRAWFORD. Is that the Beaufort Sea?

Mr. BLACKBURN. Yes.

Senator GRAVEL. Only one scheduled?

Mr. BLACKBURN. One high potential sale area scheduled in the next 5 years.<sup>1</sup>

Senator LONG. They are settling an area up there the size of the State of California.

Senator GRAVEL. Twice that size.

Mr. BLACKBURN. I find that distasteful.

Senator LONG. Frankly, we need that energy out there. You would think we could get people to go up there and make friends with the polar bears, if they had to.

Senator LONG. People can be very friendly to polar bears.

Mr. BLACKBURN. Particularly in the development of the shale oil industry it is going to take some legislation to handle the environmental considerations.

Senator GRAVEL. The point you make, sir, with the one sale, as I recall the area in question, what would be your inclination? Bristol Bay would be in the water. You would have to get permits on refuge.

<sup>1</sup> Almost concurrently with this hearing, Secretary Andrus announced a revised draft lease schedule which includes some additional Alaska-OCS sales.

Have you had any success in getting permits in refuge?

Mr. BLACKBURN. I am not aware of any.

Senator GRAVEL. Neither am I.

Senator LONG. One or two things concern me. One of them is that the situation in the world market is going to get worse. Ambassador Schmidt told the President, and told the press, and told some of us individually, that he expects that the price of world oil will quadruple— increase fourfold. He said it is very simple how that is going to happen. There is nothing to hold it down.

You are totally at the mercy of the exporting countries, and they have mutual interests in raising the price.

Now, you are speaking for the American Petroleum Institute and that has a lot of economic power. Those companies produce about, I should think, over 70 percent of all the oil we are producing, do they not?

Mr. BLACKBURN. Yes, sir. That is a good approximation.

Senator LONG. All right. That speaks for most of the capital that private enterprise has available. The Government is not drilling.

Your people are looking at alternative sources, I am sure; are they not?

Mr. BLACKBURN. Well, yes, sir, we are. As I mentioned, we tried shale oil. We are doing a lot of enhanced recovery research.

Do you mean alternatives to oil and gas? We are working on solar; we are working on coal.

Senator LONG. I am talking about the American Petroleum Institute, not just Shell.

Mr. BLACKBURN. Yes, sir; alternative sources are being worked on.

Senator LONG. Some of the companies have pretty big budgets. For example, Exxon has a larger budget than you have to work with.

Mr. BLACKBURN. They have more money than we do.

Senator LONG. They are a bigger company; they have more money.

What concerns me is that we ought to be trying to make this Nation energy-independent. To do that, we will have to be producing a huge amount of energy from these so-called alternative sources.

We are going to have to be developing shale. We are going to have to make a lot of energy other than just burning coal in a boiler. We are going to have to make a lot of gasoline out of coal and we are going to have to go ahead with developing other sources.

Why cannot the API tell us how it could be done and what it would take?

My impression is that the Arabs, especially the Saudis, do not want to sell us anymore oil; in fact they are inclined to cut back on what they sell us now. If the price is going to quadruple, you can understand why.

They have a finite amount of energy.

What can you tell us about the views of the American Petroleum Institute on the potential of America's becoming an energy-independent Nation again?

Mr. BLACKBURN. Well, the short-term outlook for that is not good. It is a question of degree.

We are going to become a relatively more independent Nation as far as energy is concerned. The long-term outlook is attractive.

We have the energy resources in this country which, if properly utilized, can put us back to being energy-independent again. We are running out of time in which to do it very quickly.

We have 400 billion tons of coal reserves, or some enormous number that I can never completely remember, but we have a lifetime, or several lifetimes, of coal supply.

What is going to have to be done, we have to do a better job as a Nation in resolving the conflicts that arise between the development of energy sources and the environment. There is always going to be a conflict. We have to do a better job of resolving those conflicts.

Senator LONG. You are going to require an incentive a little more favorable to the producers.

Mr. BLACKBURN. Those in the United States may want to entertain the idea. I do not want to be trying to tell the Congress exactly what they should do.

Conceivably, there is legislation needed to help resolve some of these environmental conflicts we find ourselves in.

I think for the utilization of even more coal, we have problems. For straight utilization of it, strip mining regulations are a problem; a whole synthetic gas industry which may arise from coal. You can make synthetic gas from coal. That is going to have a number of environmental aspects to it in terms of mining the coal, transporting the coal.

Given that, it might be conceivable to make the synthetic gas; you still have to mine the coal.

The shale oil industry is certainly locked up with environmental problems.

Senator LONG. Let me ask you one other thing: Do those Japanese cars use the same kind of catalytic converters we use on American cars?

Mr. BLACKBURN. I do not know.

Senator LONG. It seems to me that somehow we need to get a more efficient way to burn gasoline in the engines themselves. Exxon, as you know, has said they have a development that would save about 10 percent, just by making better use of what we have in operating electric motors.

To what extent do you think the answer is just making better use of energy?

Mr. BLACKBURN. There is no question that part of the answer lies in that. Our long-term forecast, for example, for gasoline demand is for the Nation to use less gasoline in the 1980's than it uses now, because the cars are going to get more miles per gallon. In fact, the Congress has mandated that they get more miles per gallon. Before they manufacture cars, they have to give us more mileage.

The result is, we will use less gas in the 1980's than we do now. That is a very favorable outcome.

Conservation is an extremely important aspect of the whole thing, but we are not going to solve the total problem with conservation.

Senator LONG. Did your people take a look at this automobile that gets 84 miles per gallon?

Mr. BLACKBURN. No, sir; not to my knowledge.

Senator LONG. They had it up on Capitol Hill a while back.

Mr. BLACKBURN. I am not familiar with it.

Senator LONG. It does not look as though it would be very comfortable, but with the choice of getting there or not getting there, I would rather have that than walk or ride a bicycle.

Thank you very much, Mr. Chairman.

Senator GRAVEL. Senator Wallop?

Senator WALLOP. Thank you, Mr. Chairman.

Let me just dig a little into this synthetic energy issue.

First of all, I think it would be more than helpful if API could become specific as to what laws need changing. We can sit here and carry this line of argument back for a speech in Louisiana or up in Alaska or Wyoming and say we are going to have changed some environmental laws, and somebody will come along and say, "Which?" and you just say, "Some."

You have to get more specific in that area, especially with regard to the development of oil shale and the in situ techniques of developing liquefied coal and gasified coal.

Mr. BLACKBURN. I think that is a fair comment. In a way, I really had not intended to give you testimony on that particular subject.

Senator WALLOP. I appreciate that, but I think at some time it should be made available as a part of the public record. Sooner or later we are going to have to receive more details.

We see ourselves not being able to reach out to synthetic fuels. Look at South Africa. They are building two coal gasification plants at considerable cost.

Why is it possible for them to do it on an economic basis and sustain the economy and not this country?

Is there any response to that? How can South Africa do it when surrounded by everybody in the world? They go build a couple of those plants, yet the technology is still out beyond the reach of America.

Mr. BLACKBURN. Yes, sir. The technology is available to synthesize gas from coal at the moment. The economics of doing so in the United States are not yet favorable. The economics of doing so in South Africa probably are favorable, for a couple of reasons.

South Africa has enormous—the same kind of coal deposits we do. Very low mining costs. A good bit of the coal traded in the world right now is South African coal, plus, they are not subsidizing their consumers with cheap domestic oil, and they have not been subsidizing, to my knowledge, cheap domestic gas, for years.

We subsidized our cheap domestic gas and, to some degree, we still are, and we subsidize our economy with cheap oil. They are not in that situation. Their economics are probably considerably different than ours.

Senator WALLOP. I am sure they are, partly because they have no other resource available to them, but let me ask you this.

Would it be possible for API to give this committee a comparison based on gross national product, or percentage of energy required, as to the gas that is being gasified from coal in the South African economy versus what the same kind of gas would cost this economy?

Mr. BLACKBURN. That is a fair request, and we will do what we can.<sup>1</sup>

Senator WALLOP. Let me ask you one other thing. With regard to synthetics, is there any thought, has there been any thought given, to whether or not API would support the kind of thing that we did with Utah tar sands or gasified coal or oil shale in Colorado and Wyoming?

<sup>1</sup> Material is attached to prepared statement of Mr. Blackburn.



As you recall, what the Government said was, we will buy it all from you at this price. If you can sell it at a higher price than that, go ahead on and go to the market.

For a long time, the Federal Government was the only purchaser.

Now, I do not think they purchase any except for what it needs for itself.

Is that an attractive thing?

Mr. BLACKBURN. There has been a lot of discussion internally in various companies. It is a pretty difficult thing to discuss from one company to another, but there have been position papers written on whether or not there should be floor prices, as you describe.

There are a lot of mixed feelings about floor prices. If you want a guaranteed price, the tendency is that somebody wants to limit the ceiling, too.

Personally speaking, not for API, I am not too strongly in favor of floor pricing. What I am trying to say, you probably would never get a decision out of the mixture of companies, the mixture of views on that sort of thing. It would not be an API decision. You might readily get the views of individual companies.

Senator WALLOP. The thing that concerns me, as Ambassador Schmidt says, if the price is going to quadruple about the time the technology came online, the encouragement has long since passed. I think we ought to get on to producing synthetic fuels.

Mr. BLACKBURN. Let me try to give you some response to that.

Senator WALLOP. I think it relates to deregulation, ultimately, and the reinvestment of profits for the production of energy. As Senator Long was asking, what would it take for us to be energy independent?

You mentioned the near term outlook, that did not look very good. How long is near term?

Mr. BLACKBURN. The next decade, maybe longer.

Senator WALLOP. If we got underway with it? A decade is not too long if you had a prospect out there. You see a lot of other developments taking place.

Mr. BLACKBURN. That is right. Let us keep in mind that the lead time is quite long. The lead time in developing Alaskan offshore leases would be 6, 7, 8 years from the time you actually start, so that is why I say, at a minimum it is a decade, and that is probably an optimistic estimate.

Senator WALLOP. It takes 8 years on a coal mine on leases already existing.

Mr. BLACKBURN. We sold some coal from Wyoming to Louisiana, as a matter of fact. We are going to transport it, and I think we hope to get that mine open by 1985. We are trying to get permits, at the moment—which we hope to get, incidentally. We hope to get it open by 1985.

Senator LONG. If I may interject at that point, we in Louisiana are selling oil at \$6 a barrel. We are paying \$40 a barrel to get it back—we are not complaining about that—to get it back as diesel fuel to use on our boats to get more energy.

We are selling gas at 30 cents a thousand. We are willing to pay Mexico \$2.60 a thousand.

What bothers us is that nobody seems to be willing to make any sacrifices or to do anything to solve the problem. Instead, we are saying oh, no, don't drill in Alaska. At least 50 percent of Alaska is too precious to be drilled at all, historically.

What historic person in the world was up there with an ax 500,000 years ago? I do not know. All I know is that human beings were supposed to have roamed all over the whole planet at some prehistoric time.

Then we are told, don't disturb the pristine pureness of the ocean out there because it is so fantastic. The water that goes back in has to be cleaner than the water that came out, as though we are out there for the purpose of making fresh water out of salt water rather than finding energy.

Wherever we turn, we are told that they are scared to death somebody might make a profit and that the environment must come first.

After awhile, we will have a beautiful, clean environment just freezing to death in clean air and clean snow. At some point, somebody is going to have to put production up front as your principal objective.

Mind you, the environment is fine, but at some point you have to say which comes first: the cleaner environment, or full production, and some of these things get to be pretty ridiculous, like some of the things you have been confronted with out there in the Gulf of Mexico trying to produce. All these safeguards.

How long do you reckon it took, if you start from bidding on a lease, how long did it take from the time you would apply for a lease to the time you could have production and put in a pipeline?

Mr. BLACKBURN. In Alaska?

Senator LONG. Louisiana.

Mr. BLACKBURN. We will have Cognac on production by January of this year, I believe. As I recall, we bid on the lease in 1974.

Senator LONG. 1974.

Mr. BLACKBURN. Close to 6 years.

That is a little longer than normal for the Gulf of Mexico. Normally it would be like 4 years in the Gulf of Mexico from the time we bid on a lease and get them on production.

Senator LONG. How long did it take you before?

Mr. BLACKBURN. East Bay, of course, the conditions were not as severe. The water was shallow. We were on production in a year or two.

Senator LONG. Thank you very much.

Senator GRAVEL. Senator Durenberger?

Senator DURENBERGER. No questions.

Senator GRAVEL. I know you must leave.

First off, who was your partner in Colorado?

Mr. BLACKBURN. Ashland was one. I believe they were the ones we assigned our interests to.

Senator GRAVEL. You gave them \$60 million?

Mr. BLACKBURN. No, sir, we just assigned them our interest. Subsequently, they have assigned their interest to Occidental.

Senator GRAVEL. And they have assigned theirs?

Mr. BLACKBURN. I think Occidental still retains their interest in the lease.

Senator GRAVEL. Are they doing anything with it?

Mr. BLACKBURN. They were going to try to do in situ recovery. I do not know exactly where that stands. I do not think they have started that.

They have a new process they think might work.

Senator GRAVEL. Has anyone written anything in-house with respect to the number of permits and why the decision was made to turn over the \$60 million or assign your interests? Is there anything that would be valuable for the record?

Mr. BLACKBURN. I would have to go home and look.

Senator GRAVEL. Would you do that?

This is where we are in a quandry of trying to prove the case, and when you make a decision involving some \$60 million, walking away from that, you obviously had to have some fairly strong specifics.

I wonder if you would share that with us and if you could, it would be very valuable to try and not have to face that situation again, if it is within our power to do that.

Mr. BLACKBURN. Yes, sir. I will see what we have.

Senator GRAVEL. That would be very valuable testimony. Very good. Thank you very much for coming forward. I am sorry we held you so long.

Mr. BLACKBURN. Thank you.

[The prepared statement of Mr. Blackburn follows:]

STATEMENT OF CHARLES L. BLACKBURN, EXECUTIVE VICE PRESIDENT FOR EXPLORATION AND PRODUCTION OF SHELL OIL CO.

Mr. Chairman and members of the Committee. I am Charles L. Blackburn, Executive Vice President for Exploration and Production, Shell Oil Company. I am pleased to be here today on behalf of the American Petroleum Institute.

We believe the Administration's decontrol program is a significant and necessary step to move our Nation toward sound solutions of our most serious energy problems. The gradual removal of government controls on crude oil prices will provide eventually many benefits to the American consumer and the American economy.

ADDITIONAL DOMESTIC PRODUCTION

There is no doubt that additional petroleum supplies can be produced in the U.S. Shell's assessment of the U.S. oil and gas resources, assuming continued improvement in technology and a favorable economic climate is shown in Chart 1.

Total production of oil and gas in the United States to date represents about 50 percent of the total amount that ultimately will be produced. Of the remaining unproduced oil and gas resources, about 45 percent has been discovered and 55 percent is yet to be discovered. We estimate that there are 60 billion barrels of oil and 305 trillion cubic feet of gas yet to be discovered. In addition, we estimate that there are about 20 billion barrels of oil recoverable through enhanced recovery methods.

Phased decontrol will provide incentives and capital to stimulate more drilling and production. The historical record shows that every time there has been an increase in oil prices, there has been a major increase in drilling activity.

Chart 2 illustrates this historical relationship between the real price of crude oil and the number of wells drilled in the United States. During World War II, oil prices were frozen at pre-war levels. When controls were removed in 1947, the real price of crude rose and as a result drilling rose even faster. From 1959 to 1972 the real price of crude oil declined and drilling declined even more. In 1973, the average price of oil turned upward because of the effect of world prices on U.S. Prices. This price rise has stimulated increased drilling activity.

While it is impossible to calculate how many additional dollars will generate how many new barrels of oil, one thing is certain—the supply of crude oil is positively related to price.

Chart 3 shows Shell's forecast of increased domestic oil and gas production, if all crude oil price controls were removed 1/1/79, compared to production under continued controls. Volumes are expressed in millions of barrels of crude oil equivalents per day—MMBE/D.

This chart indicates that the production response to crude oil price decontrol to be around 1.5 MMBE/D by 1985 and continuing to grow throughout the forecast period.

This forecast assumes instantaneous decontrol and reinvestment of the incremental revenue due to crude oil price decontrol. With phased decontrol as proposed by the Administration, the production response will be significantly less—approximately 600 MBE/D in 1985: less than half of what is potentially available to the Nation.

Chart 4 presents an historical pattern of reinvestment for the oil and gas producing industry. This chart shows clearly that industry activity is responsive to incentives and cash availability, since investment (as a percent of cash income) has been maintained at a high level since the price increases of 1973.

A dramatic example of the reinvestment process is Shell's Cognac platform. In 1978, Shell, as operator for a group of producers, completed installation of this platform, which is the world's tallest (1100') and heaviest (51,000 tons) steel drilling and production platform, in the Gulf of Mexico. This one project represents an investment of nearly \$800 million.

If one were to disregard the highly significant considerations of national security, national economy, and international balance of payments, there would still remain a further important aspect. This is the specific cost trade-off of imported oil versus domestic oil and gas production. Thus the question is posed: what does the volume of production added by decontrol cost the economy as compared to the cost of importing that same volume?

Chart 5 shows the incremental cost of increased domestic supply resulting from crude oil instantaneous decontrol as compared to importing an equivalent volume of oil.

The panel on the left shows the specific cost trade-off of imported oil versus domestic oil and gas production on an annual basis. The revenues retained by the private sector (exclusive of payments to governments), resulting from decontrol of crude oil prices and associated incremental oil and gas production, approximate the economic cost of the incremental domestic oil and gas production on a current expenditure basis. Alternatively, equivalent crude oil volumes could be imported at "world prices." Initially, as the incremental domestic production would be quite small, it would be cheaper (on a current expenditure basis) to import equivalent crude oil volumes rather than pay domestic producers decontrolled prices. However, the annual payments for imports would exceed the current economic costs of the same crude oil equivalent volume of domestic oil and gas production resulting from crude oil price decontrol after 1984.

The right panel uses the same basic data as in the first chart but shows the cumulative difference between the costs. In other words, the plot reflects the cost of imports (black bar) less the cost of domestic supply (white bar) on a cumulative basis.

Again it shows that the cost of domestic supply is less than import costs after 1984—that is where the cumulative costs reach their largest deficit. After 1984, the deficit is continually reduced at ever increasing rates and in the late 1980's the cumulative cost of increased domestic supply is less than import costs—that is where it crosses the zero line. Looking beyond this payout point, the cumulative savings to the Nation resulting from crude oil decontrol could reach on the order of \$30 billion by 1993, the last year of the analysis, and should continue to grow. Further, and very importantly by 1993, there would be about 5 billion crude oil equivalent barrels of additional domestic oil and gas developed reserves (capital costs paid) as a result of crude oil decontrol. This represents a substantial benefit to our Nation from crude oil price decontrol.

#### INDUSTRY PROFITABILITY

At this point, I would like to say a word about the profitability of the oil industry as compared to other industries. Chart 6 compares the oil industry net income, expressed as a percentage of stockholder equity for the 10-year period 1968-78 with other industries. As can be seen, the rate of return for the oil industry is in line with total manufacturing; and below other major industries.

#### INDUSTRY INVESTMENTS

It is clear that under any plausible assumption of uncontrolled domestic crude oil price, revenues retained by producing companies will fall far short of their future needs—even without additional taxes.

Independent bank studies have concluded that the industry will have to expand its capital investments greatly in coming years to maintain present oil and gas reserves. Just for domestic exploration and production alone through the

next five years, industry investment will have to average \$22.5 billion a year (Chase Manhattan Bank) to \$28.5 billion (Bankers Trust) in constant 1978 dollars. Total domestic oil and gas expenditures, according to the Bankers Trust, will have to be \$32.7 billion per year.

When comparing these capital requirements with the additional funds which would accrue to producers as a result of decontrol, it is clear that no additional taxes are necessary. It has been estimated that the decontrol of prices—without the imposition of additional taxes would provide only about \$6 billion per year over the next 3 years. This clearly reflects the fact that even if all additional producer revenues resulting from decontrol were retained by the producers, the required capital needs would not be met. If a portion of these badly needed funds are taxed away, the gap between capital availability and capital needs of the industry will be widened. The result obviously will be less oil and gas.

Since the facts point clearly to the need to reinvest all revenues available from decontrol, one must ask why the Administration is proposing additional taxes on these incremental revenues. Perhaps the answer is a concern that such capital will not be reinvested in finding and developing new energy and increased energy sources. Any such concern can be put at rest by looking at the historical pattern of investment by the petroleum industry. That history demonstrates that when oil companies' revenues have increased, they have used their cash flow and added borrowed money to do more exploration and drilling.

A recent study of 33 major oil companies conducted by Salomon Brothers indicates that the net income of the companies has increased from \$12.0 billion in 1976 to \$13.7 billion in 1978, or some \$1.7 billion, while capital expenditures increased from \$22.5 billion to \$25.7 billion for a gross increase of \$3.2 billion, or more than 180 percent of the increase in net income. In 1978, the oil industry invested \$1.87 for every dollar of net income received.

Of course, oil companies like other corporations, are able to draw on sources of internal funds other than net income for their investment program. The most commonly used financial concept to describe the net funds available to corporations from internal sources to finance their requirements is retained cash flow. Retained cash flow is the sum of net income and return of capital on investments through depreciation and amortization less dividend payments to shareholders. To the extent that a corporation is able to maintain a level of capital expenditures equal to or less than its retained cash flow, that corporation will be able to maintain a level of capital expenditures equal to or less than its retained cash flow, that corporation will be able to finance its growth without relying upon the costs and risks of accessing external capital.

A similar study was conducted as to the respective levels of retained cash flow and capital expenditures for the 33 companies. The result of the study revealed that in only one year (1973) during the 1971 through 1978 period was the oil industry able to generate retained cash flow in excess of its capital expenditure program. In every other year capital expenditures significantly outpaced retained cash flow leaving the companies with a net deficit to be financed from external sources. The deficit ranged from a low of \$76 million (1974) to a high of \$6.5 billion (1975) for a total deficit of \$16.8 billion during this eight-year period.

In order to finance this deficit of capital expenditures relative to retained cash flow, to pay back maturing long term debt and to maintain working capital at acceptable levels, the oil companies, according to the study raised more than \$46.3 billion during the 1971 through 1978 period by the issuance of long term debt and new equity. More than 28 percent of this total amount, or \$13.1 billion of external capital, was raised in the two years 1977 and 1978. I would respectfully submit that this degree of dependence on external funds for normal business purposes is not consistent with the "awash in cash flow" characterization which has been frequently ascribed to the oil industry.

#### WINDFALL PROFITS TAX

The proposed windfall profits tax has been premised on the assertion that the decontrol crude oil price results in "excessive" or "unearned" profits, and that the public interest requires that these "windfall profits" be reduced by a tax, the proceeds of which will be used for some socially beneficial purpose. Let us examine whether economic theory and the plain facts of the matter support the proposition that decontrol results in "windfall profits" which should be the subject of additional taxes.

The first matter to be considered is that governments are going to take off of the top of every dollar of additional revenue generated by decontrol some 50 to 60 percent under the existing tax structure. This conclusion is consistent with that of the U.S. Treasury.

Exactly how much would be received by government depends on whether the analysis views the situation with or without reinvestment of the available cash flow. However, regardless of approach or assumptions as to the nature of any reinvestment expenditures, the federal, state, and local government share of any crude oil price increment would range from 50 to 60 percent, even without new taxes.

If one assumes none of the incremental revenue is reinvested, federal, state, and local governments would capture an estimated 58 percent of that revenue after normal dividend distribution and producers would have only about 28 percent available for investment. If one assumes that any incremental crude oil price increase is used by producers in their ongoing operations, including reinvestment in finding and developing new crude oil reserves and none is distributed to shareholders, government would still receive the largest share of this revenue. Set out below is a table showing the distribution of any crude oil revenue under these two assumptions.

	Without reinvestment	With full reinvestment
<b>State and local governments:</b>		
Royalties .....	0.01	0.01
Taxes on private royalty .....	.01	.01
Taxes on producers .....	.09	.12
Subtotal .....	.11	.14
<b>Federal Government:</b>		
Royalties, bonuses, rentals .....	.02	.08
Taxes on private royalty .....	.05	.06
Producer income tax .....	.35	.21
Income tax on dividends .....	.05	.....
Subtotal .....	.47	.35
Total government .....	.58	.49
Total private royalty owner .....	.06	.07
Total shareholder .....	.08	0
Total available for reinvestment by producer .....	.28	.44

<sup>1</sup> Plus taxes on suppliers of goods and services.

Accordingly, viewed from any perspective, the government, not the petroleum industry, would capture the bulk of any so-called "windfall" attributable to the increase in domestic crude oil prices.

The remainder of the revenue—after existing taxes—is not a proper subject of a special tax based on the allegation that it is unearned or a "windfall." This revenue is, rather, a consequence which is normal in a free market economy and reflects a function which is essential to the efficient operation of our economy.

To use a hypothetical example, if one undertakes to produce a widget, which with an adequate profit is anticipated to sell for \$1, and if at the time the product is ready for market the demand is such that a price of \$1.50 is obtainable, then one may say that a "windfall" of 50 cents a unit results. Assuming, however, that the cost to produce each widget has not increased, this "windfall" profit will draw into the market additional producers with the result that the "windfall" will not long endure; i.e., supply will catch up quickly with demand and the price will drop to one commensurate with the cost of production.

Suppose, however, that the cost to produce each widget increases because of a component which is limited in nature such that additional supplies are more difficult and expensive to obtain. Examples of such components may be limited resources such as gold, real estate, or oil. In this situation, the additional supply will be attracted by the windfall profit but, having been obtained at a higher cost, it will not have the effect of driving the price down even when supply catches up with demand: the additional supply at the higher cost can continue to be maintained only so long as the price which reflects that higher cost is maintained. Windfall or not, the fact of the matter is that the added supply prompted by such a profit will not be sustained if the price received is not commensurate with the cost—not the cost in prior periods, but the cost now.

Applying this to the production of oil, some economists would say that the business of producing a limited natural resource is going to result in windfall profits in a sense, because by the nature of things costs are going to be increasing. The oil that is easier to find will be found first and the oil that is cheapest to produce is going to be produced first. Whether or not one accepts the applicability of the

term "windfall profits" to the revenue from decontrol, the revenue in question is an essential element in providing the needed supply response.

One further comment is appropriate at this point. At any assumed price, \$16, \$18, or whatever, there is a barrel of domestic oil that can be produced which at any lesser price will not be produced—will be left in the ground. Initial production may take out of the ground only about 15 percent to 20 percent of the oil. In combination with waterflood, perhaps 30 percent may be recovered, but at a higher total cost. Injecting CO<sub>2</sub> or nitrogen or detergent chemicals may recover a significant part of the remaining oil, but the increases in costs are steep. To give you a feel for how price sensitive domestic crude oil availability can be, a study by the National Petroleum Council, an advisor to the Administration, says that the difference between \$20 per bbl. and \$25 per bbl. on tertiary projects means a difference of 3.5 billion barrels.

So, if we choose to pay the world price to the foreign producer and to deny that price to the domestic producer we are substituting the foreign barrel for a domestic barrel. We are denying the domestic producer the opportunity of maximizing his production to the level that he might have had we been willing to pay him the price we are willing to pay the foreign producer.

In this connection, we sometimes hear this contention. In a free market, it is not unreasonable to expect that replacement cost will govern price but in the case of crude oil, the market is not a free market but, rather, one controlled by OPEC. Under these conditions it is the edict of OPEC, not replacement cost, which sets the world price. The argument goes that since the market price is controlled by OPEC rather than by true replacement cost, some synthetic replacement cost must be developed to be used in determining a reasonable market price for domestic crude oil.

But let us think about that for a moment. Assume that we pay \$18 for a barrel of oil coming from abroad. Can we replace that barrel for less than \$18 from domestic sources? I submit to you that if we can substitute a barrel of domestic oil at a cost of \$18 then it is irrational not to do so. The reason we would not do so is obvious. We simply could not displace that barrel from domestic sources for less than \$18.

This concept of matching revenues with replacement cost is not novel, nor peculiar to the petroleum industry. For at least forty years, the last-in, first-out (LIFO) method of costing inventories has been sanctioned as an appropriate method to use in determining net income for both financial reporting and tax reporting. Indeed, the purpose for which the LIFO method was developed was to mitigate distortions in financial and tax reporting which were attributable to phantom profits caused by escalating costs. Were it not for replacement cost methods of accounting, going concerns would be forced to contract rather than expand because they would otherwise be forced to pay taxes, dividends, etc., on profits which properly should be retained to replace the goods sold.

I must mention, however, that conventional financial and tax accounting concepts do not classify oil and gas reserves in situ as "inventory", but I think the analogy is apparent.

The point has been made that the tax is necessary because the industry will not and cannot use these revenues for additional energy supplies. The material in this statement regarding the capital expenditures the industry and others believe necessary to produce these additional supplies shows that the industry can use these revenues and more in its quest for additional and reliable supplies. Further, I believe that "the past is prologue," and that the industry has demonstrated it will reinvest its revenues for additional energy supplies. In this connection, I would point out that a Treasury Department study has concluded that the large integrated oil companies during the period 1971-77 spent an average of only about 4 percent of their total available cash for buying other companies, and this includes companies engaged in the energy field.

The point has been made that a tax is necessary because it will tend to mitigate OPEC induced price increases. This argument is specious because for each additional dollar paid to governments in additional taxes, there is one less dollar available to be spent expanding domestic supply. As a consequence, each barrel of domestic oil which is not produced because of insufficient return represents an additional barrel of oil which must be purchased from abroad, even though the price paid the foreign producer might have provided a sufficient return for the domestic producer. This obviously worsens our balance of trade, and thereby tends to punish our total economy.

Additionally, the tax permits foreign producers to raise their prices higher than they would otherwise be prompted to do. This occurs because the domestic

producer must, in determining the price at which it is economic to sell his production, sell at a price which will take into account any additional taxes. If his taxes are at a rate of 50 percent, then foreign producers can raise their prices by twice the increase in the domestic producer's costs without becoming noncompetitive vis a vis domestic production. For example, if U.S. real costs of producing oil and gas rise by \$4 per barrel with no incremental tax, the OPEC price could also rise \$4. However, with a 50 percent tax on the incremental revenue received by U.S. producers, OPEC could raise its price by \$8—since that action would automatically trigger another \$4 of U.S. tax costs applicable to the new domestic oil production.

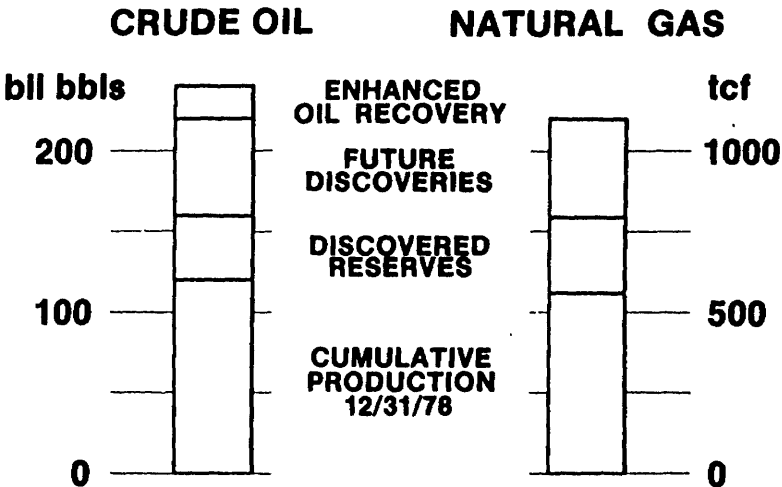
This last matter brings to mind an especially disturbing fact about the proposed windfall profits tax, and that is subjecting "newly discovered" oil, stripper, and enhanced recovery oil to the so-called OPEC tax. Subjecting this oil to the OPEC tax is tantamount to the imposition of permanent controls on domestic crude oil. In effect, it substitutes a complicated tax for the current complicated system of price controls. Continuation of controls only postpones the day of final reckoning with the nation's energy problem and, by hastening the economic decline of domestic production, shortens the time available for research and development of synthetic and alternative energy supplies. Decontrol without additional taxes invites, indeed encourages, activity as regards synthetics and alternative energy sources by providing economic incentives while, at the same time, providing for reliable sources of oil and gas in the interim.

There is no doubt, however, that the decontrol of domestic crude oil prices will create some dislocations in the economy. This was stated as an additional reason for the imposition of a windfall profits tax. API supports efforts to deal with social problems prompted by decontrol but believes that these problems are best dealt with conventionally. Indeed, the Treasury Department's own figures indicate that governmental entities will receive about 50 to 60 percent of each additional dollar of revenue attributable to decontrol without any additional taxes. Moreover, these figures indicate that there will be about \$6.1 billion in additional revenues available without the imposition of additional taxes during the three years 1979-81.

#### SUMMARY

In summation, we believe that decontrol of domestic crude oil prices will provide additional supplies of oil and gas through continued reinvestment by the industry. This will move our Nation toward sound solutions of our most serious energy problems and provide eventually many benefits to the American consumer and the American economy. Considering the enormous costs of these undertakings, no additional taxes are necessary and in fact will be counterproductive.

## OIL AND GAS RESOURCES





## CHART—OIL AND GAS RESOURCES

Shell's assessment of the U.S. oil and gas resource is shown on this chart. Approximately 50 percent of the resource has been produced. Of the remaining resources, approximately 55 percent is associated with future discoveries. On an energy equivalent basis, the oil and gas resources are about equal.

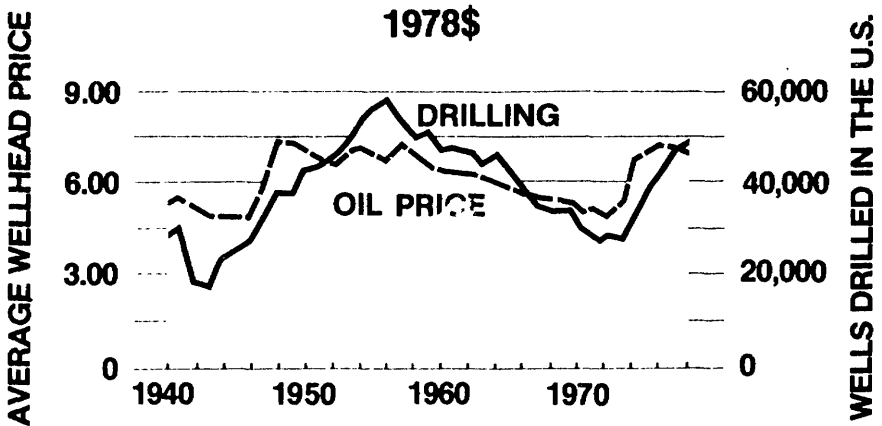
The assessments of future discovery volumes are based on geologic reviews in each basin and assume continued improvements in technology and a favorable economic climate. Nevertheless, there is considerable uncertainty associated with estimates of future discovery volumes.

Production, reserve, and future discovery volumes are summarized by category as follows:

	Crude (billion barrels)	Natural gas <sup>1</sup> (trillion cubic feet)
Cumulative production.....	120	560
Discovered reserves.....	40	235
Future discoveries.....	60	305
Enhanced oil recovery.....	20	.....
<b>Total.....</b>	<b>240</b>	<b>1,100</b>

<sup>1</sup> Excludes underground storage of 5,000,000,000,000 ft<sup>3</sup>.

## UNITED STATES THE PRICE OF CRUDE OIL AND DRILLING RATE



CHART—UNITED STATES: THE PRICE OF CRUDE OIL AND DRILLING RATE

This chart illustrates the historical relationship between the real price of crude oil and the number of wells drilled in the United States. During World War II, oil prices were frozen at about the pre-war level. When the controls were removed in 1947, the real price of crude rose about 50 percent in 2 years and remained at about the same level for a decade. Measuring from 1946 (because steel was allocated, depressing drilling 1942-45) the drilling rate increased sharply; the increase lagged the price increase but continued on upward after the price leveled out. This 1947-56 drilling boom created a surplus productive capacity of several million barrels per day in the United States.

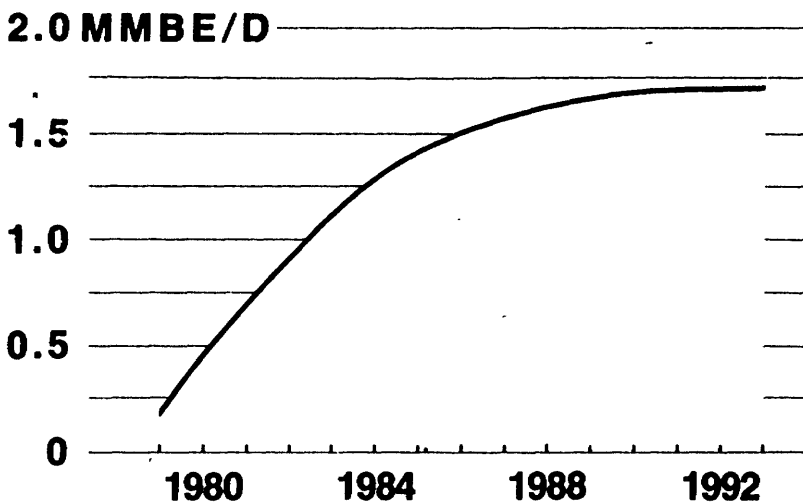
In 1959, a mandatory oil import control program was imposed. This program tended to set a ceiling on prices. Section 6 of Presidential Proclamation 3279

dated March 10, 1959, provided that the Director of the Office of Civil and Defense Mobilization would maintain a constant surveillance of the program and specifically said " \* \* \* in the event prices of crude oil or its products or derivatives should be increased after the effective date of this proclamation, such surveillance shall include a determination as to whether such increases are necessary to accomplish the national security objectives." This provision resulted in warnings against increases in the price of crude oil and investigations when prices were raised. From 1959 to 1972 the real price of crude oil declined 21 percent.

From 1958 to 1972, as the real price of crude oil declined, drilling declined even more. Then in 1973, the average price of oil turned upward because of the effect of world prices on U.S. prices. By 1978, the average domestic oil price was nearly 50 percent above the 1972 level, after correction for the effect of eliminating percentage depletion.

Virtually all prices, including oil prices, had been frozen by the government in August 1971. When price controls on other goods and services expired in May 1974, new legislation kept price controls on lower-tier (so-called "old") oil and on petroleum products. During 1974 and 1975, the price of upper-tier ("new") oil was free of federal controls, which led to an upturn in drilling during those years. Controls were imposed on upper-tier oil in December 1975, however, and they have remained until now in ever-increasing complexity.

## INCREMENTAL OIL AND GAS PRODUCTION FROM OIL DECONTROL



CHART—INCREMENTAL OIL AND GAS PRODUCTION FROM OIL DECONTROL  
DESCRIPTION

This chart shows Shell's forecast of increased domestic oil and gas production resulting from decontrol of crude oil prices. Volumes are expressed in millions of barrels of crude oil equivalents<sup>1</sup> per day—MMBE/D.

<sup>1</sup> Gas converted to equivalent barrels of crude oil on the basis of heat content (5.6 thousand cubic feet equivalent to a barrel).

As can be seen, the base case analysis indicates that production response to crude oil price decontrol to be around 1.5 MMBE/D by 1985 and continuing to grow throughout the forecast period.

This forecast assumes instantaneous decontrol and reinvestment of the incremental revenue due to crude oil price decontrol. With phased decontrol as proposed by the Administration, production response will be significantly less—approximately 600 MBE/D in 1985: less than half of what is potentially available to the Nation.

#### KEY FACTORS

The magnitude of the forecast production response is, of course, sensitive to the characteristics of, and variables incorporated in, the model used in this analysis. The more significant factors are:

1. the reinvestment ratio (percent of cash income reinvested): base case assumes an average near 70 percent.

2. the reserve-to-production ratio: the base case assumed 8.

3. the efficiency factor (the fraction of incremental reserves added per incremental dollar invested in the controlled price case): the base case employs a 90-percent factor to recognize possible constraints such as technical staff declining resources in the Onshore (Lower 48) provinces, etc.

Varying these factors within reasonable limits suggests that production response in 1985 is most likely to fall within the range of from 1.0 to 1.8 MMBE/D.<sup>2</sup>

#### ANALYTIC METHOD

This analysis is based on the proposition that investments in domestic oil and gas exploration and development are proportional to the domestic oil and gas industry's internal cash generation and, further, that the results (productivity) of these investments will not change markedly if the investments are varied within reasonable limits dependent on land, equipment, and manpower availability. It is, of course, implicit that these investments must generate an adequate rate of return.

A recent Shell forecast of domestic oil and gas industry volumes and financial performance was used as a basis for comparison. This forecast had incorporated the assumption that lower and upper tier oil would remain controlled.

In calculating the effect of crude oil decontrol, it was premised that the resulting price increases would be translated into cash income and reinvested consistent with observed historical relationships. The resultant incremental oil and gas discoveries and additions to reserves were taken as proportional to the incremental investment in each of the years analyzed in accordance with the relationships in the Shell (controlled price) forecast. The system was assumed to be immediately responsive to changes in income and investments. Discoveries, reserve additions and new production were considered to be a mixture of oil and gas in the same ratio as the Shell (controlled price) forecast.

Once the change in the system is initiated, it becomes self-generative in that the incremental investments also generate cash income which, in turn, is reinvested to produce more income. In fact, after 1985, income from the incremental investments is estimated to exceed that from increased revenues solely due to decontrolling oil prices.

This is a very simple model of the domestic oil and gas industry. As a consequence, some aspects of the oil and gas business were not simulated precisely and others were necessarily omitted. Among these, the most notable are (1) the assumption of instantaneous reinvestment and associated production response from the incremental revenue due to crude oil price decontrol, and (2) the omission of production response from existing oil wells as a result of increased price incentives. The effects of these two factors would tend to offset one another.

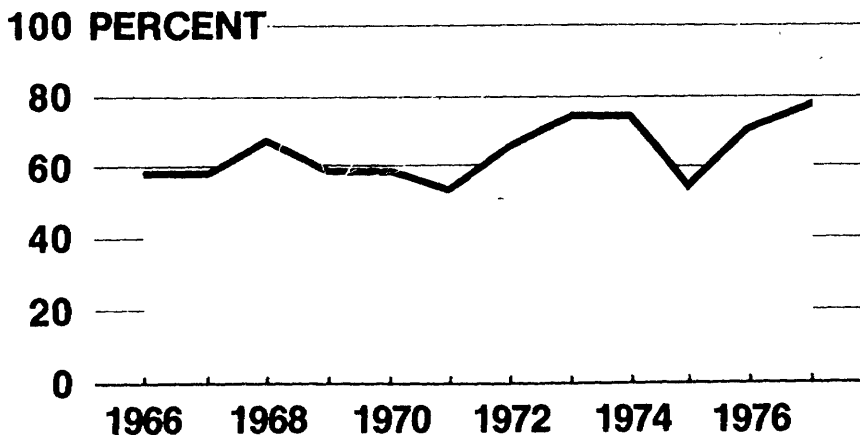
<sup>2</sup> See attached sensitivity analysis.

## SENSITIVITY ANALYSIS—PROJECTED INCREMENTAL PRODUCTION IN 1985

	Reserve/ production ratio	Oil and gas production <sup>1</sup>
Additions to reserves efficiency factor:		
0.8.....	10	1.04
	9	1.13
	8	1.24
	7	1.36
0.9.....	10	1.19
	9	1.30
Base case.....	8	1.42
	7	1.57
1.....	10	1.35
	9	1.47
	8	1.61
	7	1.79

<sup>1</sup> Million barrels crude oil equivalents per day.

## CAPITAL EXPENDITURES AS A PERCENT OF CIAT

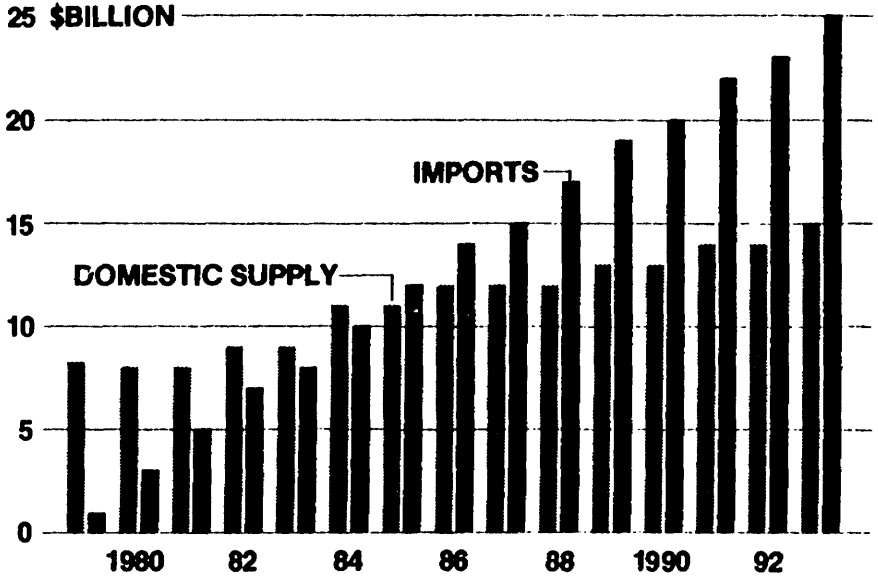


CHART—CAPITAL EXPENDITURES AS A PERCENT OF CASH INCOME AFTER TAX (CIAT)

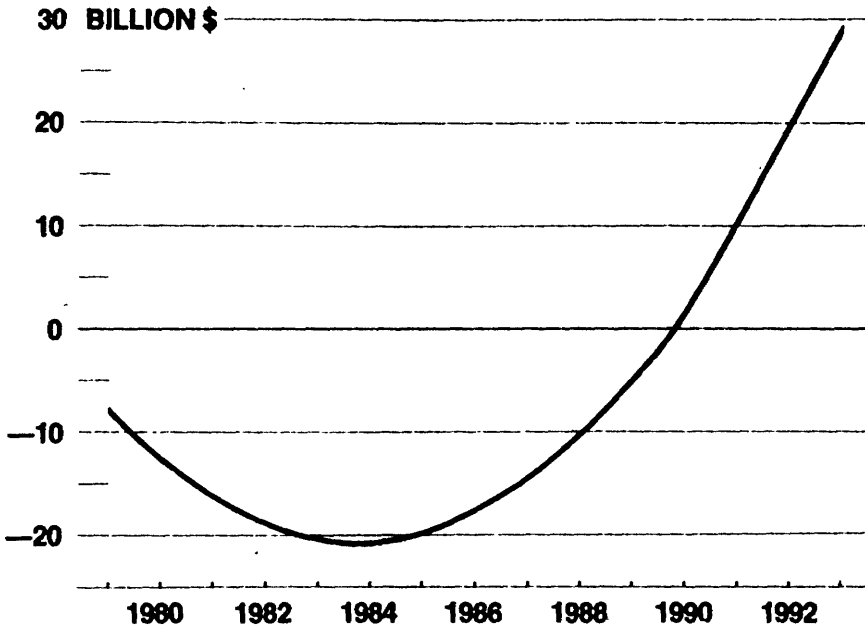
A historical pattern of domestic reinvestment is shown for the oil and gas producing industry in this chart. It demonstrates that industry has reinvested about 70 percent of after-tax cash income.

# COST OF INCREASED DOMESTIC SUPPLY FROM OIL DECONTROL vs. IMPORTING SAME VOLUMES

## ANNUAL INCREMENTAL COSTS



# CUMULATIVE BENEFIT OF INCREASED DOMESTIC PRODUCTION vs. INCREASED IMPORTS



CHART—COST OF INCREASED DOMESTIC SUPPLY FROM OIL DECONTROL VS.  
IMPORTING SAME VOLUMES

The next series of charts shows the incremental cost of increased domestic supply resulting from crude oil decontrol as compared to importing an equivalent volume of oil.

#### LEFT PANEL

The panel on the left shows the specific cost trade-off of imported oil versus domestic oil and gas production on an annual basis. The revenues retained by the private sector (exclusive of payments to governments), resulting from decontrol of crude oil prices and associated incremental oil and gas production, approximate the economic cost of the incremental domestic oil and gas production on a current expenditure basis. Alternatively, equivalent crude oil volumes could be imported at "world prices". Initially, as the incremental domestic production would be quite small, it would be cheaper (on a current expenditure basis) to import equivalent crude oil volumes rather than pay domestic producers decontrolled prices. However, the annual payments for imports would exceed the current economic costs of the same crude oil equivalent volume of domestic oil and gas production resulting from crude oil price decontrol after 1984.<sup>3</sup>

#### RIGHT PANEL

The right panel uses the same basic data as in the first chart but shows the cumulative difference between the costs. In other words, the plot reflects the cost of imports (black bar) less the cost of domestic supply (white bar) on a cumulative basis.

<sup>3</sup> See attachment for discussion on the costs comparison.

Again it shows that the cost of domestic supply is less than import costs after 1984—that is where the cumulative costs reach their largest deficit. After 1984, the deficit is continually reduced at ever increasing rates and in the late 1980's the cumulative cost of increased domestic supply is less than import costs—that is where it crosses the zero line. Looking beyond this point, the cumulative savings to the Nation resulting from crude oil decontrol could reach on the order of \$30 billion by 1993, the last year of the analysis, and should continue to grow. Further, in 1993, there would be about 5 billion crude oil equivalent barrels of additional domestic oil and gas developed reserves (capital costs paid) as a result of crude oil decontrol.

The increase in oil and gas supply should tend to lower oil and gas prices. This would be an additional benefit to the Nation's (and the world's) consumers that could be significant by the mid-1980's. For example, recent Iranian events have resulted in a reduction in world crude oil supply of some 1½ million barrels per day or about the same as the incremental oil and gas volume indicated to be forthcoming after 1985 as a result of crude oil decontrol. It has been demonstrated that a supply change of this magnitude has a marked impact on world oil prices to all consuming nations.

And finally there will be the benefits associated with aspects of national security, national economy, international balance of payments, energy conservation, etc.

#### SUPPORTING DATA ON ECONOMIC COSTS OF CRUDE OIL PRICE DECONTROL (CURRENT EXPENDITURE BASIS)

##### 1. Rationale for Cost Comparison

The comparison made is of the economic costs that would be incurred by U.S. consumers for domestic oil and gas production resulting from crude oil price decontrol versus the alternative costs of importing the same energy equivalent volumes of crude oil. The comparison is based on current expenditures rather than accrued values, which understates the benefits of crude price decontrol by the value of the developed new reserves at the end of the forecast period (about 45 billion barrels crude oil equivalent). The economic cost of imports is assumed to be the incremental annual volume times the world market price in that year.

The economic cost of domestic petroleum production resulting from price decontrol is defined here as the portion of incremental revenues paid to the petroleum industry private sector (i.e., private royalty owners, shareholders, and suppliers of land, industry goods and services) after deducting the applicable tax accruing to the Government from those revenues. It is assumed that Government expenditures (and taxes) and the U.S. money supply are unaffected by the alternatives being considered, so that the domestic oil and gas supply cost is essentially a direct transfer of after-tax funds from the consuming public to the petroleum industry private sector. Adjustments were made to account for the timing of noncurrent tax deductions and the effects of net withdrawals/infusions of money in the domestic economy vis-a-vis imports (as described in section 3).

The applicable Federal tax rates at the point of effective taxation are assumed to be as follows:

	<i>Percent</i>
Private royalty owners and shareholders.....	40
Producer's goods and services (labor).....	20
Corporate income (before reinvestment).....	46

##### 2. Distribution of Revenues for Economic Cost Calculation

###### A. Revenue from a price change:

Royalty.....	15
State and local government.....	2
Federal Government (2 percent royalty, 5 percent taxes)....	7
Private royalty owners.....	6
State and local taxes.....	9
Dividends.....	12
Federal Government at 40 percent tax.....	5
Shareholders.....	7

A. Revenue from a price change—Continued	<i>Percent</i>
Lease bonus capital.....	6
Federal Government.....	3
Private sector share.....	3
-----	-----
-----	-----
Producer's goods and services.....	58
-----	-----
Federal Government at 46 percent tax.....	12
Federal Government at 20 percent tax.....	9
State and local government.....	1
Private sector share.....	36
-----	-----
-----	-----
B. Revenue from new production:	
Royalty.....	15
-----	-----
State and local government.....	2
Federal Government.....	7
Private royalty owners.....	6
-----	-----
-----	-----
State and local taxes.....	9
Dividends.....	10
-----	-----
Federal Government.....	4
Shareholders.....	6
-----	-----
-----	-----
Lease bonus capital.....	6
-----	-----
Federal Government.....	3
Private sector share.....	3
-----	-----
-----	-----
Producer's goods and services.....	60
-----	-----
Federal Government at 46 percent tax.....	6
Federal Government at 20 percent tax.....	10
State and local government.....	1
Private sector share.....	43
-----	-----
-----	-----
C. Revenue Distribution Summary (percent):	

Source:	Price change	New production
Federal Government share.....	36	30
State-local share.....	12	12
Industry private sector.....	52	58
Private royalty owners.....	(6)	(6)
Shareholders.....	(7)	(6)
Goods and services.....	(39)	(46)
-----	-----	-----
-----	-----	-----
Total.....	100	100

### 3. Adjustments for Tax Timing and Domestic Wealth

Revenue distributions in the preceding discussion were adjusted for delays in tax deductions to account for the fact that not all tax deductions can be taken simultaneously with expenditures. It was assumed that tax deductions for a portion of the exploration capital would occur on the average 10 years after the expenditures. Similarly, tax deductions for depreciable development capital would be taken 5 years after the expenditures. These deferred exploration and development capital tax deductions were estimated to be 6 percent and 9 percent of annual revenue, respectively.

A separate adjustment was imposed on the cost comparison to represent the effects of withdrawing or infusing funds into the general economy. It was premised that in periods when the cost of the incremental domestic production exceeds the cost of importing the same volumes, funds would be unavailable for consumer spending that would otherwise generate a tax flow (at 20 percent for goods and services) to the Federal government. Conversely, when the incremental domestic production costs are less than import costs (for the same volumes), a tax benefit flows to the Federal government for alternative consumption. Hence, 20 percent of the difference between domestic production and import costs was charged against domestic production costs in years when imports were the cheaper and credited to the domestic production costs in years when imports were the more costly.



# NET INCOME AS % OF STOCKHOLDERS EQUITY (RATE OF RETURN)

1968 — 1978

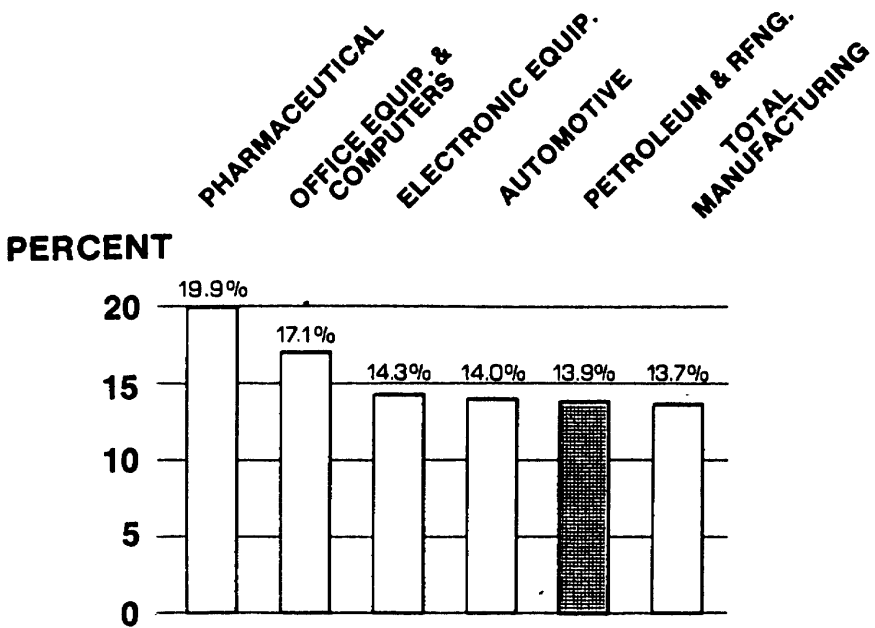


CHART NET INCOME AS PERCENT OF STOCKHOLDERS EQUITY (RATE OF RETURN)  
1968-78

As can be seen on this chart, the oil industry rate of return as measured by net income as percent of stockholders equity is in line with other industries.

	Percent
Petroleum and refining.....	13.9
Pharmaceutical.....	19.9
Office equipment and computers.....	17.1
Electronic equipment.....	14.3
Automotive.....	14.0
Total manufacturing.....	13.7

SHELL OIL Co.,  
Washington, D.C., July 10, 1979.

HON. MIKE GRAVEL,  
Chairman, Finance Subcommittee on Energy and Foundations, U.S. Senate, Washington, D.C.

DEAR SENATOR GRAVEL: Mr. C. L. Blackburn, Executive Vice President of Shell Oil Company testified before your Subcommittee on behalf of the American Petroleum Institute June 11, 1979 on the Administration's policy with respect to

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deregulation and the establishment of an excess profits tax. During that hearing, Mr. Blackburn was requested to provide additional information on three items for inclusion in the hearing record.

The first was a request for an additional copy of the report by A. T. Guernsey, entitled "Economics of Domestic Crude Oil and Natural Gas Exploration and Development, 1959 to 1976." That is attached.<sup>1</sup> The second concerned the Subcommittee's interest in South African coal conversion projects; specifically, how it is possible for that nation to proceed with coal gasification on an economic basis. The third related to Shell's former partnership in a federal oil shale lease (Tract C-b) in Colorado.

The two latter issues are addressed below and in the accompanying attachments.

### *1. South African Coal Conversion Projects*

The best data available on the South African SASOL projects appears to be contained in Attachments No. 1 and No. 2. Attachment No. 1 is a presentation made by J. C. Hoogendoorn, Manager of Research and Development for the South African Coal, Oil and Gas Corporation, Ltd., at the Ninth Synthetic Pipeline Gas Symposium in November, 1977. According to Mr. Hoogendoorn, the SASOL II Coal Conversion Plant which will be operational in 1980, can supply 5% of their nation's 1976 energy demand. Much of this energy will be in the form of liquids from Fischer Tropsch units, ammonia and other chemicals because the nation has a limited demand for natural gas. The potential supply of gas from SASOL II, if demand warranted, is equivalent to 340 million cubic feet per day of natural gas.

The paper also provides information on SASOL II project economics which reinforces Mr. Blackburn's testimony that U.S. subsidizing of consumers with cheap domestic oil makes such projects uneconomical here. Mr. Hoogendoorn stated: "Under our circumstances where our coal fields are in the interior, close to the motor fuel market, we expect to operate SASOL II at a modest profit." When this statement was made, the delivered cost of foreign crude oil to the U.S. was \$14.30 per barrel. If a similar cost is assumed for South Africa and additional cost is allowed for transporting the crude 400 miles to the Sasolburg area, the total cost of crude oil to this market was probably above \$16 per barrel. Refining costs, profit component, and the \$1.70 per barrel excise tax would have to be added to this to get to the equivalent motor gasoline market price above which they are making a modest profit. All of these costs translate into an uncompetitively high equivalent crude oil price for product in the U.S. marketplace, where the combined price of imported and low-cost domestic crude oil will approach only \$15 per barrel, even with the recent price increases. Since the South African government has a policy supporting coal liquefaction projects and participates in financing, the risks to companies is low relative to the U.S. Correspondingly, a "modest profit" for SASOL would translate into an unacceptably low profit for a U.S. venture which would incur the higher risks associated with the extensive permitting process, technical uncertainty with a pioneer project, and non-guaranteed financing obligation of the entering firm.

The second attachment is a segment of the United Nations' paper on World Energy Supplies 1972-1976. This paper compares South Africa with other countries on the basis of primary energy production, trade and consumption. The consumption data shows that South Africa per capita commercial energy use is a little less than half of that consumed by Developed Countries; but about seven times that consumed by Developing Countries. Also, South Africa is largely dependent upon domestically produced coal and liquefied gas energy fuels. Imported liquid fuels provide about 20% of energy consumed, compared to about 80% from produced solid fuels.

### *2. Oil Shale Tract C-b*

The reasons why Shell withdrew from the federal oil shale project on Tract C-b in Colorado are contained in the three attachments which were copied from our files. These are: 1) a Head Office Management Letter, dated November 2, 1976; 2) a transmittal memo titled "Position Paper on Oil Shale", dated October 6, 1976; and 3) the private and confidential "Position Paper", dated October 1, 1976.

<sup>1</sup> Report was made a part of the committee file.

The reasons why Shell withdrew from both the Tract C-b project and the Colony project are detailed in the "Position Paper", which was edited to a very minor degree, only to exclude certain proprietary data. Your attention is directed to the "other problems" (related to the C-b tracts) on pages 8 and 9. This section of the paper clearly establishes that environmental roadblocks were viewed as perhaps the biggest deterrent to any commercially viable shale oil project. The last paragraph on page 10 casts the same dark shadow on the Colony project. Shell's share of investment in these two projects, through July 1976, are detailed on Tables I and II to be about \$30 million.

We trust the foregoing will satisfactorily answer the Subcommittee's questions. Please let me know if we may be of any further assistance in this regard.

Sincerely,

DAVID B. GROSS.

Attachments.

## **GAS FROM COAL FOR SYNTHESIS OF HYDROCARBONS**

**J. C. Hoogendoorn**  
**Manager, Research and Development**



**J. C. HOOGENDOORN**

**SOUTH AFRICAN COAL, OIL AND GAS CORP. LTD.**  
Sasolburg, South Africa

## GAS FROM COAL FOR SYNTHESIS OF HYDROCARBONS, STATUS OF SASOL II

by  
J. C. Hoogendoorn

Sasol which is the acronym for South African Coal, Oil and Gas Corporation Limited, announced during December 1974, that it will build a large new oil from coal plant in South Africa, with a capacity of many times the present one. Now, November 1977, the actual construction of the plant is well underway. The major process design has been completed, most of the equipment has been ordered and first equipment items are arriving at the construction site.

This paper will deal with some of the process decisions, the philosophy behind the project and some vital statistics.

The original Sasol plant in Sasolburg, which came into operation during 1955, was designed to produce liquid hydrocarbons for motor fuels via the Fischer-Tropsch route (FT). For the production of the synthesis gas the Lurgi pressure gasification process was chosen, whereas for the FT synthesis the decision was made to install the German developed fixed bed synthesis process as well as the American concept of synthesis in a circulating fluid bed reactor system. Whereas the fixed bed synthesis plant appeared to behave more or less as designed, the circulating fluid bed concept needed much further experimentation, research and modifications before it could be accepted as a practical industrial tool. However, over the years both systems have been developed to the point where they can be considered as completely reliable and of the same class of operability as other major chemical processes.

In addition to the continuing research and development by Sasol on improvement of production and operability of the gasification as well as synthesis systems, Sasol also spends considerable effort on research in alternative methods to produce oil from coal. This R and D work resulted in a pilot plant using solvent refined coal techniques. The main objective with this work was to get completely familiar with the chemical and engineering problems associated with such a coal conversion technology and by combination of such R and D results with Sasol's industrial experience in coal conversion, to translate the claims made for the superiority of such second generation processes into more realistic expectations.

When in 1974 the decision for a new large plant was taken, it was therefore immediately obvious that this could only be based again on FT technology as other technologies were not yet at a point where they could be seriously considered for large scale commercial application.

The size of the plant resulted from a number of local South African considerations and indicated that the total volume of motor fuels (gasoline plus diesel oil) would have to be of the order of 1,500,000 metric tons per year. From this resulted the approximate size of the coal gasification plant. The first question was which gasification system to apply. The choice really lay between the Lurgi pressure gasification with which Sasol is completely familiar and to which Sasol has made a large contribution in terms of the present state of development, or a high temperature, low pressure entrained gasifier system using pulverised coal. This system has been applied at much smaller scale (according to Sasol's standards) as a syngas producer for ammonia. As a result of the high temperature it does not produce coal gasification byproducts, nor does it produce methane which may be of advantage for the small producer but its oxygen consumption is high and the raw gas needs compression to bring it to an acceptable level for purification. The carbon conversion is relatively low. The Lurgi pressure gasification has the advantage for the Sasol objective that gas is produced approximately at the pressure required for FT synthesis so that compression of the large volume of raw gas is not required. On a large plant, processing facilities for the gasification

byproducts can be economically justified and where it is the objective to make commercial hydrocarbons from coal it would not make sense to destroy the volatile hydrocarbons in the coal with oxygen into syngas from which later hydrocarbons would have to be resynthesised again. Also, though initially the methane produced in the raw gas would have to be reformed to hydrogen and carbon monoxide in a separate reforming plant, the option would be kept open to sell this methane later as pipeline gas in a growing fuel gas market. Even with reforming of the methane the total oxygen consumption of gasification and reforming combined would still be lower than in the entrained low pressure gasifier.

All these considerations expressed in terms of capital investment, operating cost and income indicated that for Sasol II again the decision would be to use Lurgi gasifiers. Over the years a number of improvements to the Lurgi gasifier have been made, resulting in a design known as mark IV which incorporates all the present technology extrapolated to a larger capacity within the limits of confidence. This is the type of gasifier which will also be used in the American SNG plants. The next decision was which gas purification system to apply. Here again a large number of options are open but in all cases a combination of two or more systems would be required to remove not only the last traces of tar and tar products such as cyanides, aromatics, etc., but also organic sulphur and hydrogen sulphide as well as carbon dioxide. Only the Rectisol process with methanol as solvent could do all these things in one single plant. Economic studies indicated that Rectisol would be the best choice. Engineering work and studies for American SNG plants have led to the same conclusion.

The next major step would be the actual production of hydrocarbons by synthesis from hydrogen and carbon monoxide.

In the existing Sasol plant the fixed bed synthesis is mainly used to produce higher boiling hydrocarbons and a large percentage of the production from this type of plant is in the form of solid paraffin waxes for which a low volume market exists at higher than motor fuel prices. The circulating fluid bed synthesis is operated in such a way that the production is mainly in the form of lighter hydrocarbons in the LPG, gasoline and diesel range whereas also a certain amount of watersoluble oxygenates is produced. In the FT synthesis the range of products obtained depends on the composition and physical and physical properties of the catalyst, pressure, temperature, gas composition, etc., and not on the actual reactor system, whether this is fixed bed, fluid bed or slurry bed. After selection of the catalyst and its operating conditions, one decides on the reactor system best suited for the selected conditions. One should always consider the reactor system and the selectivity to primary products in conjunction with the product refinery to obtain the required range of final products. If motor fuels (gasoline and diesel) are the main required products then this can be obtained through a selectivity mainly directed to lighter hydrocarbons and subsequent conversion of the lighter olefins to larger molecules or by aiming for large hydrocarbon molecules in the synthesis followed by a refinery containing refinery steps such as hydrocracking. To achieve the optimum, one should therefore compare catalyst system, reactor type and refinery as one overall system. The slurry bed reactor has not yet been built on a sufficiently large scale to give reliable economic data for a large scale energy situation. The circulating fluid bed and the fixed bed with reactor tubes and steam production for heat control have both been developed to the point where they are completely reliable and predictable in their operation. The fixed bed reactor in this form, however, has the draw-back that its possibilities for scale up are limited. The reactors at Sasolburg contain 2,000 tubes of 2-inch dia. in one pressure shell and have a capacity of approximately 25,000 tons of primary product per year. Even if it were possible to increase the size of this reactor to the point where it reaches double the capacity, which would be a major engineering undertaking, the total number of reactors required for the planned Sasol II production would be between

35 and 40, all with their own recycle systems and recycle compression and instrumentation. Though it would, of course, be possible to group a number of reactors together on one larger recycle system with one recycle compressor, this would lead to rather complicated piping and valve systems and with unavoidable variation in pressure drop over the different reactors, this will in practice lead to a rather unattractive control system from an operating point of view. The circulating fluid bed reactor does not have such size limitations and can be confidently scaled up to a much larger size and Sasol II will contain only seven of these reactors in an optimised form. Studies in which actual equipment designs and quotations have been used have shown that the investment in the synthesis section would be more than double for the scaled up fixed bed against the scaled up circulating fluid bed, whereas no compensation could be expected in the form of lower refinery cost. Also catalyst cost and energy requirements per ton of product are lower for the circulating fluid bed. Though the fixed bed reactor is certainly a useful tool for the production of special hydrocarbons, such production does not form part of the required Sasol II product package and therefore, the Sasol II refinery will only use circulating fluid bed reactors.

The product recovery and refinery is markedly different from the Sasol I flowsheet. In the Sasolburg plant, after cooling of the product gas, most of the non-condensed hydrocarbon products are recovered in an oil-wash system and the tailgas can be used for pipeline gas or reformed back to hydrogen and carbon monoxide by partial oxidation with oxygen and steam. In this system, recovery of C<sub>2</sub>'s is low, most C<sub>2</sub>'s remaining in the tailgas.

In the Sasol II plant the oil-wash is replaced by a low temperature unit which recovers as separate streams a light oil, a C<sub>3</sub>/C<sub>4</sub> stream, a C<sub>2</sub> stream, a stream of approximately 90 percent methane and a hydrogen rich stream. The C<sub>2</sub> fraction goes to an ethylene plant where the ethylene is recovered and the ethane is recycled and cracked to extinction, producing additional ethylene. The hydrogen rich stream goes back as recycle to the Synthol reactors whereas a part of the stream is used to produce high purity hydrogen for the refinery operations and catalyst production. Part of the methane is used as internal fuel gas for the plant complex and the major portion is reformed by partial oxidation to hydrogen and carbon monoxide for recycle. With future expansion of the pipeline gas market this methane stream can, of course, be diverted to the pipeline system. The product refinery is geared to the South African marketing pattern which requires mainly motor fuels, the majority in the gasoline range. The light olefins are combined by polymerisation and the polymer product will be partly hydrogenated to limit the final olefin content in the gasoline. C<sub>5</sub>/C<sub>6</sub> hydrocarbons will be isomerized and the C<sub>7</sub> to 400°F fraction will be platformed. The above 400°F material will be treated in a DSC unit (distillate selective cracking) to produce diesel oil and some gasoline fractions. The gasoline components will be blended to regular and premium gasoline.

The aromatics distilled from the tar products will also go to this gasoline pool. The gasoline will be marketed partly through Sasol's own marketing organisation and partly by the major oil companies and will of course satisfy the normal requirements for modern motor fuels.

Sasol II will be situated upstream of the large populated Witwatersrand area and though its water supply situation is not critical, it was decided to design for maximum re-use of effluent to limit the actual effluent to the catchment area to practically zero. The two main sources of effluent are gasification which produces gas liquor and FT synthesis which produces a watery effluent containing soluble oxygenates and organic acids. The gas liquor is first treated in a phenosolvan plant where by extraction with isopropylether the watersoluble phenols are recovered as a crude tar acid fraction and ammonia is stripped off the liquor and purified by a further absorption/stripping plant into liquid ammonia of synthesis quality. The

FT reaction water is stripped of its non-acid chemicals which are recovered as marketable products such as ethanol, propanol, acetone, etc. The remaining effluent, containing organic acids and the stripped gas liquor, is then biologically treated in activated sludge units and further purified by ion exchangers and activated carbon to a purity where it can be used as cooling water make up. A small part of the plant effluent contains inorganic salts and these effluents such as boiler blow down, etc. are brought into an evaporation plant for disposal. A purge stream from the cooling water system is used for the hydraulic ash transport. In total, this system will result in an overall raw water requirement of 11 cubic metres of water per ton of product. This is much lower than the corresponding figure for the original Sasol plant where a high effluent purity was also required for the disposal, but where water conservation was not yet of prime importance. In cases where scarcity of water justifies this, the figure could still be considerably lowered by cleaning part of the effluent further to boiler feedwater quality and increase of air cooling relative to water cooling to remain in balance.

The plant will be supplied with coal from the Bosjesspruit Colliery, belonging to the overall plant operation. The total amount of coal consumed will be approximately 12.8 million tons per year of which 8.4 million tons will be gasified and 4.4 million tons used for steam and power production. The power production of 240 megawatts was chosen to arrive at a balance between fine coal and coarse coal. An additional amount of power will be bought from the public utility electricity system which operates large power stations in the Sasol II area.

The colliery is situated on an extensive coal field covering an area of approximately 30,000 hectares, which contains sufficient coal for more than 60 years.

The coal seam is nearly horizontal, has an average thickness of 2.7 m and is between 100 m and 200 m deep. Access to the coal is by means of two shaft systems, each consisting of a 11 m diameter man and material shaft, a 10 m ventilation exhaust shaft and a 6.4 x 2.5 m inclined shaft at 17°.

The coal will be mined by means of continuous miners and longwall systems; it will be transported by belt conveyors from the workings through the two inclined shafts to the factory; it will be crushed, stockpiled, wetscreened and fed into the steam generation and gasification plants.

Establishing a new mine requires, of course, a long lead time and in order to have sufficient coal front developed by the time that Sasol II comes into operation the mine is now already producing coal from its initial fronts. This coal is at present sold to a nearby power station.

It should be noted here that the quantity of gas produced would, if methanated, be equal to a production of 340,000,000 scft per day of SNG.

Summarising the plant description, Figure 1 shows the design flowsheet for the plant and some of the important figures associated with the plant are tabulated as follows:

#### Coal Composition

Subbituminous heating value, gross, dry basis 23.9 MJ/kg (10,300 Btu/lb.).

Surface moisture:	6-11%
Inherent moisture:	5%
Ash (dry basis):	21.5%
Carbon (daf):	79.6%
Sulphur (daf):	1.3%
Hydrogen (daf):	4.3%



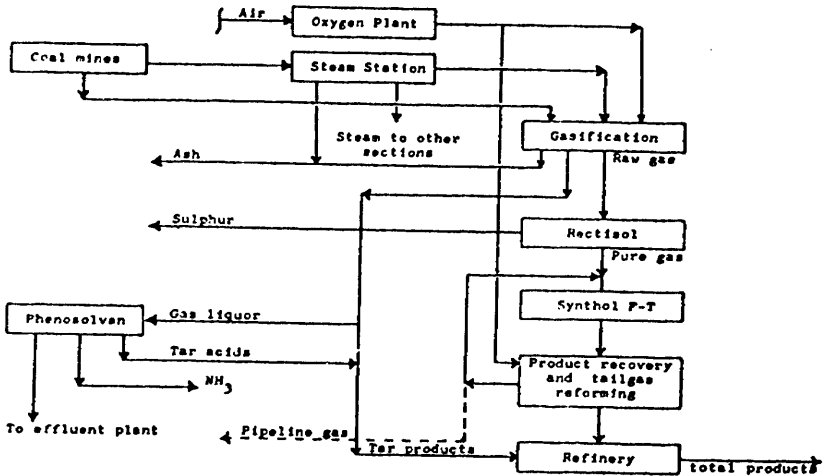


Figure 1.

Nitrogen (daf): 2.0%  
Oxygen (daf): 13.6%

**Gasification**

Coal feed: 8,400,000 mtpj  
H. P. steam: 1,230 mtpj  
Oxygen: 8,600 mtpd  
Gasifiers: 36 installed, diameter 4.0 m  
Raw gas: 1,650,000 m<sup>3</sup>/h (1,500 × 10<sup>6</sup> scft/day)

**Rectisol Gas Purification**

Raw gas feed: 1,650,000 m<sup>3</sup>/h (1,500 × 10<sup>6</sup> scft/day)  
Pure gas: 1,100,000 m<sup>3</sup>/h (1,000 × 10<sup>6</sup> scft/day)  
Number of streams: 4  
Total S in pure gas: 0.07 ppm

**Gas Composition**

	Raw Gas	Pure Gas
	Vol. %	
CO <sub>2</sub>	32.0	1.5
H <sub>2</sub> + CO	57.1	84.1
CH <sub>4</sub>	9.4	13.5
H <sub>2</sub> S	0.7	—
N <sub>2</sub> + A	0.3	0.5
C <sub>n</sub> H <sub>m</sub>	0.5	0.4

**Oxygen Plant**

Capacity: 6 units of 2,300 mtpd each  
Oxygen pressure: 3,400 kPa (500 psi)

**Steam Plant**

Capacity: 6 boilers of 540 mtph each,  
430°C, 4,000 kPa (580 psi)  
Coal feed: 4,400,000 mtpa

**Cooling Water System**

Circulating rate: 165,000 m<sup>3</sup>/h (726,000 "S gpm)  
Temperature range: 27-40°C  
Number of cooling towers: 4  
Dimensions: bottom diameter 105 m (345 ft.)  
height diameter 151 m (500 ft.)  
Type: natural draught

**Synthol Plant**

Number of reactors: 7  
Total gas feed: 1,900,000 m<sup>3</sup>/h

**Gas Reforming**

Feed gas: 225,000 m<sup>3</sup>/h (90% CH<sub>4</sub>)  
Product gas: 550,000 m<sup>3</sup>/h (4% CH<sub>4</sub>)  
Oxygen consumption: 3,400 mtpd  
Number of reformers: 8

**Sasol II Production**

Motor fuels: 1,500,000 mtpa  
Ethylene: 185,000 mtpa  
Chemicals: 85,000 mtpa  
Tar products: 180,000 mtpa  
Ammonia (as N): 100,000 mtpa  
Sulphur: 90,000 mtpa  
Total saleable products: 2,140,000 mtpa

**Plant Labour Requirements***Skilled and semi-skilled*

Production: 1,000  
Maintenance: 1,800  
Technical staff: 160  
Admin. and general staff: 400  
Mine: 700

*Unskilled*

Plant: 1,000  
Mine: 2,000

**Area**

Process plant: 196 ha (490 acres)  
Tank farms: 93 ha (235 acres)  
Admin. and dispatch: 135 ha (340 acres)  
Central area (workshops, etc.): 33 ha ( 80 acres)

Effluent treatment: 165 ha (415 acres)  
Ash disposal: 180 ha (450 acres)

Progress on the project is as follows:

The decision to build the plant was taken in December 1974. Though Sasol could make its own decisions on the overall design of the plant and the process steps to be incorporated, Sasol needed, of course, an overall engineering contractor to do the project management and to coordinate the sub-contractors. Fluor was selected for the overall project management job and the initial phases of the work were coordinated from Los Angeles. Lurgi took responsibility for the design and supply of major equipment for gasification and reforming and also for the design of rectisol and phenosolvan and ammonia recovery. Badger was contracted for the Synthol area. The oxygen plant will be supplied by L'Air Liquide and the steam and power station by Deutsche Babcock. Linde designs and supplies the low temperature gas separation plant and the ethylene plant. Refinery processes were obtained from UOP and Mobil Corporation. Site preparation started during March 1976 and work on foundations, sewerage systems, railways, etc. is in full swing. Erection of the steel structures is progressing fast and the first gasifiers will arrive on the site for lifting onto the steel structure during November 1977. The Synthol units are too big for road transport and it was decided to build these on site. A workshop for this purpose was erected by CBI where the plates are rolled into shape and welded and the completed vessels stress relieved. This workshop is already in full production. At present there is a work force of approximately 10,000 men of all skills on the job and during the peak activity this work force is planned to be approximately 15,000. It is expected that commissioning will start during 1979.

Sasol made the original estimate during 1975 on a 1974 price basis, using its own in-house cost information.

A revised estimate made in co-operation with Fluor early in 1977 after most of the process details had been finalised showed an increase to R1.9 billion, in terms of 1976 money. An analysis showed that the original estimate was 9 percent too low whereas the devaluation of the south African rand in 1975 and strong inflation in the international equipment manufacturing industry between 1973 and 1976 caused a further increase. The definitive estimate made recently with all the major contracts being concluded and the work well on its way now shows that the expected end of job cost will still be within 10 percent of the original estimate, taking into account the influence of currency value adjustments and past and expected inflation rates.

To put this capital in its proper perspective, it should be mentioned that this includes not only the plant proper but also acquisition of the site, site development, development of the coal mine, all off sites and auxiliary services, utility plants, roads, office buildings, etc., in other words grass roots in the truest sense of the word. Also included are items such as home office cost, profits and overheads of the various contractors, inspection agencies and Sasol's own staff. Provision is made for personnel training and startup cost, inventories of chemicals, catalysts, maintenance spares. Not included is a new township which had to be built in the first place to house the many construction workers and supervisory staff during the construction and afterwards to house the plant personnel. This township, which is also grass roots, will have the usual facilities for shopping, recreation, etc. and Sasol finances this operation separate from the main plant.

Further, Sasol II is not a producer of syncrude but produces final products; the capital thus includes the equivalent of a refinery and of capital-intensive plants for the production of anhydrous ammonia and ethylene.

Here are some words on the viability of the operation. Though there seems to be general agreement that in the near future the world will have to rely more on coal than in the past and that plants for conversion of coal into gas and motor fuels will be essential, there is still a lot of discussion on the desirable timing and choice of processes. From our own experience with FT and our r and D into alternative methods we know that second generation processes may indeed have some advantage in thermal efficiency and capital investments if they were available today. We also know, however, that it will still take many years before such plants are practical and reliable commercial propositions and that the possible saving in capital cost will be more than off-set by continuous inflation during this development period. This does not mean that one should not put in a lot of effort into the development of second generation plants but it does mean that if the proper statutory climate and marketing background exist there is no reason to delay the building of plants based on present technology. On the contrary, building and operation of plants with today's technology will confront the engineers and industrialists with the real-life opportunities and problems of coal conversion and stimulate a more speedy development of new generation processes into commercial realities.

In the South African scenario we are in the fortunate position that there are no legal obstructions for this type of enterprise. There are stringent regulations for environmental requirements, health and safety aspects but fortunately these are not clouded by emotional issues. Through a high degree of mechanisation, coal can still be mined relatively cheaply but unfortunately not as cheaply as at the original plant. Our coal cost from the new mines is of the same order as for American steam coal. The main market for the motor fuels is in the interior, approximately 400 miles from the coast. The price for motor gasoline in South Africa is based on so called import parity from the Middle East. This means that the price to the dealer before tax consists of the crude oil component, ocean freight, refinery cost, interior transport and distribution cost. This is the price which applies to motor fuels made from imported crude oil, and motor fuels from coal have to compete with this price.

There is, however, an excise advantage for gasoline produced from indigenous materials of approximately 4 cents per US gallon. This allowance to stimulate local production originated before World War II and was intended to stimulate production of shale oil. South Africa used to have a shale oil industry of a relatively small scale for a number of years, until the reserves of shale were exhausted.

Under our circumstances where our coal fields are in the interior, close to the motor fuel market we expect to operate Sasol II at a modest profit. However, if the price of crude oil increases over the next 10 years as predicted by the sooth-sayers, then Sasol II would indeed turn out to be a very interesting money spinner, as was the case with the original plant during recent years.

The scenario will, of course, differ from country to country and it is not the purpose of this paper to go into the financial and economic implications of this type of enterprise in other countries, especially not because the viability and degree of risk depend so much on non-technical factors such as the policies of governments with respect to the guarantees which the entrepreneur needs to protect his huge investments against events in other parts of the world over which he has no control at all. I want to add, however, that the viability of a project like Sasol II will continue to improve when a market for pipeline gas exists and the methane produced in the gasification plant plus what is produced in the FT synthesis itself can be sold at an equivalent SNG price. The plant investment per ton of coal feed will decrease because the reforming plants can be eliminated and the oxygen and steam plants will be correspondingly smaller and also the income per ton of coal will be higher. The total thermal efficiency of such an operation will be practically the same as for an SNG plant.

Though the Sasol II plant is primarily designed as a motor fuel producer there is, of course, the potential to use some of the primary product fractions for petrochemical purposes so that in addition to the ethylene from coal the possibility exists for further diversification into other coal-to-petrochemical activities. In total, the plants strengthen the base of the South African motor fuels and chemical industry; it will make a significant contribution to the saving of foreign exchange; it will provide a large number of job opportunities not only in the plant itself but also in all the supporting services and industries for all groups of the South African community and it will set a new standard in general for the coal conversion industry which can be considered as a target for second generation processes to improve upon.

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## QUESTIONS & ANSWERS

**J. P. Strakey, DOE**

**Q.** What is the overall thermal efficiency of Sasol I and Sasol II?

**N. Daviduk, Mobil Research and Development**

**Q.** What is the overall thermal efficiency of the process based on the heating value of the coal relative to the products produced less the mechanical energy needed and heat losses?

**A.** Lurgi pure gas contains 12-13% methane. In addition some methane is formed in the Fischer-Tropsch reaction. If a market for pipeline gas exists, this total methane can be considered as saleable product and the overall thermal efficiency from coal as mined to saleable refined end products can be as high as 60%. If by lack of market the methane has to be reformed to syngas with steam and oxygen, the overall thermal efficiency would drop to 35-40% depending on plant design. At Sasol I gas is supplied to a pipeline system and reforming is only done during periods of low gas demand (weekends). At Sasol II we will initially start with reforming depending on the growth of the gas market.

**E. F. Hardy, Jensen Associates Inc.**

**Q.** Are there interchangeability problems with liquid fuels from Sasol I and petroleum fuels? Can they be blended?

**A.** Fischer-Tropsch hydrocarbons are completely compatible with hydrocarbons derived from crude oil and no problems have been experienced in using Fischer-Tropsch components in blends for regular and premium gasoline and diesel oil.

**Hershel Jones, ERDA**

**Q.** Stated coal brought to plant by conveyor—how far is mine from plant and was cost vs. trucking considered along with comparative environmental factors of each?

**A.** Sasol I coal mine is approximately one mile from the factory site. It is an underground mine from which coal is delivered to the surface at one point. Transport to the factory is obviously more economical and convenient by conveyor belt than by trucking. Coal is kept damp on the conveyor belts by water sprays at suitable points to prevent dust formation.

**Bill Seward, C F Braun & Co**

**Q.** What sulfur-processing units are you installing at Sasol II?

**A.** To remove and recover the sulfur from the Rectisol off-gas we will use a Stretford unit similar to a unit already in operation at Sasol I.

**Q.** What sulfur compound and other emission limits are you designing for in your treatment of gaseous effluents?

**A.** The limit set for gaseous effluent from the Stretford units both at Sasol I and Sasol II is 50 parts per million  $H_2S$  discharged through a high stack. The hydrocarbons etc. still present in this gas are below the permissible limits and the gas is discharged directly to atmosphere.

**Steve Pitner, Panhandle Eastern, and Hershel Jones, ERDA**

**Q.** Briefly describe your ash disposal system. Specifically, what steps are taken to prevent ash leachate from entering ground water?

**A.** Ash is transported from the gasification and power plant areas by water in a low velocity sluiceway to the ash dewatering unit. Coarse ash is removed by conveyor belts to an ash dump. The fine ash is concentrated in a thickener and the concentrated fine ash is then dewatered in a slimes dam. The ash contains soluble inorganic salts that will leach out. The ash system is however an evaporative system for water and requires water make-up and no purge. Water drainage from the slimes dam is collected and pumped back into the ash sluiceway system. Water seepage from the ash disposal area into the underground water supply is forbidden by Government regulation. To prevent water seepage the slimes dam is given an impervious clay layer from clay available on site. The slimes dam is then built with an extensive drainage system on top of the clay to recover all seepage for return to the ash sluiceway system. Coarse ash contains no excess water and at least the outside of the dump soon dries out to such an extent that it will absorb rain water. No evidence of seepage from the ash dump has been found and no measures are taken against seepage. We have been very successful in growing grass on these dumps which makes them aesthetically acceptable. Regular samples of water from boreholes in the vicinity of Sasolburg have been taken over the past 23 years and no evidence of underground water pollution has ever been found. The same system for ash disposal will be applied for Sasol II.

been well above planned levels and inventories have been depleted," he said.

Parra was commenting on published reports that customers have been complaining of PDV delivery cutbacks.

The company aims to supply fuel oil during the third quarter in quantities "approximately equal to those supplied during the same period a year ago," he said. Stocks must be kept at adequate levels "to assure supplies to our regular customers in the coming winter season," Parra added.

He disclosed that Venezuela has been producing close to capacity and exports during the first half averaged an estimated 2.2-million b/d, 20% more than in the 1978 first-half.

#### BELGIAN OIL OFFICIAL CALLS FOR THREE-YEAR PRICE-CONTRACT PROGRAM

Brussels 6/27--Belgian Oil Federation president Georges de Graeve has said he believes a new Belgian price-contract program to take effect in September should last for three years.

It should also fulfill the following three objectives, he added:

- Guarantee energy supplies, especially oil.
- Fix supply levels within the framework of an internationally coordinated policy.
- Be sufficiently profitable to the oil industry to finance the enormous investments necessary to ensure future supplies.

Pricing is only part of an energy policy but the price contract has played a major part in stabilizing the nation's oil prices since 1974, he told the press during the presentation of the Federation's annual report.

Federation director Paul Hatry said supply difficulties had continued to grow during the first quarter when consumption of middle distillates mainly for domestic heating, was 40% higher than in the 1978 first-quarter. Belgian gasoil stocks are now below the minimum legal limit of a 75-days supply, he added.

During the first four months this year, Belgium imported 10.5-million tons of crude, compared with 10.3-million in the like 1978 period and 2.2-million tons of products compared with the year-earlier 1.5-million, according to Hatry. Also, refinery throughput was 10.6-million and 10.4-million tons, respectively, he reported.

#### SOUTH AFRICAN GOV'T GIVES OKAY FOR NATION'S FOURTH COAL-TO-OIL UNIT

Johannesburg 6/27--The South African government is reported to have given approval in principle for a SASOL-4 oil-from-coal project.

SASOL-2 and 3 are still being built with the former scheduled to come on stream in mid-1980.

A final decision hasn't yet been reached on the launch-date for the fourth plant and its location is being kept secret until the government is ready to give the final go-ahead. But a government spokesman confirmed that Pretoria had accepted the plant in principle but said "there is still no final commitment. That will depend on how the oil situation develops and on the availability of capital."

Local sources suggest that finance is the central reason why the announcement of SASOL-4 hasn't already been made.

#### INTERNATIONAL ITEMS

**MEXICO:** Petroleos Mexicanos has abandoned efforts to plug its offshore Intoc No. 1 flowout and is expediting the drilling of relief wells, according to PEMEX director general Jorge Diaz Serrano.

Efforts to close preventer valves were unsuccessful because of difficult underwater conditions, he said, so two relief wells will be spudded 300 meters from the blown-out wellhead and it will take 60-90 days to complete them.

**AUSTRALIA:** South Australian Gas Co. manager J. Burnside and Newcastle Gas Co. have recommended, independently of

each other, a 15-paise industry source said earlier (ENR 6/25). The source didn't know the reason for the postponement.

#### WASHINGTON

#### DOE GIVES GREEN LIGHT TO SPOT CRUDE BUYS

Washington 6/27--The Dept. of Energy has given a major multinational oil company advance determination it can import a spot cargo of more than 600,000 bbl of crude without violating the deemed-equity rule of federal transfer pricing regulations.

Those rules generally are aimed at preventing companies from dumping high-priced spot on the domestic market. Under the deemed-equity provisions, companies can't pass through the costs of high-priced spot cargoes until they have imported their equity liftings (ON 6/25). If the rule is violated, a certain per-ybl percentage of the cost of the crude, above a DOE established import price, is disallowed.

DOE special counsel Paul Bloom confirmed he has given written assurance to a major U.S. refiner to make an advance determination as to non-violation. He refused to identify the company or provide further details regarding the cargo.

Under the written assurance, the cost of the crude won't be subject to partial disallowance under the deemed equity requirements if the following conditions are met:

- Satisfactory written assurance by the refiner that the price of the crude is the result of a bona fide "arms length" transaction with an unaffiliated seller.
- The company promptly will provide direct access to the original and supporting documents regarding the sale to allow independent verification by the special counsel. The company won't be allowed to pre-select what data the auditor may review.
- The company must provide written assurance that the spot purchase in question is an incremental volume, over and above what the company would import to the U.S. under any international crude allocation formula.

According to Bloom, this is the first time DOE has reviewed a case prior to import, for non-violation of the regulation.

The action essentially assures the refiner the government won't disallow the per-bbl costs of the crude in excess of the representative price which will be established by DOE in the future, if the conditions outlined in the written consent are met.

Bloom called the new policy a "guarded use of sensible protection discretion." He will consider similar arrangements on an individual cargo basis provided he is convinced a legitimate transaction is taking place. Any such spot purchases couldn't be a substitution of high-priced spot for low-price equity of the crude type already promised for delivery to the U.S., he emphasized.

Overall, this new policy should encourage refiners to take advantage of individually available spot cargoes without worrying about future partial disallowance of the costs of the cargo, Bloom explained.

#### RULES PANEL ALLOWS LIMITED TAX AMENDMENTS

Washington 6/27--The House Rules Committee has agreed by voice vote to a modified rule for the June 26 floor debate of the windfall profits tax under which one weakening and one strengthening amendment can be offered to the plan reported out of the Ways & Means Committee (ON 6/27).

Reps. Moore (D-LA) and Jones (D-OK) will therefore be able to offer their plan which would lower the tax rate to 60%, end all taxes in 1990 and improve the tax position for marginal and tertiary recovery oil.

The proposal, which is a compromise between the stiffer Ways & Means bill and the weaker tax proposed by President Carter, would add \$311-million to company taxes over the

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# World Energy Supplies

## 1972-1976



UNITED NATIONS  
New York, 1978



TABLE 2

PRODUCTION, TRADE AND CONSUMPTION OF  
(CONTINUED, IN MILLION METRIC TONS OF

		PRODUCTION OF PRIMARY FORMS				EXPORTS	IMPORTS	STOCKS END YEAR (MILLION TONS)	CHANGES IN STOCKS (MILLION TONS)
		TOTAL PRODUCTION	CRUDE OIL LITERALS	CRUDE PETRO- LEUM DIST. LBS	REFINED LBS				
WORLD	1972	7962.160	2416.305	2087.085	1097.074	176.476	211.171	480.200	480.201
	1973	8117.630	2465.260	2137.072	1252.612	205.061	226.271	246.190	246.179
	1974	8226.424	2502.070	2206.967	1375.599	217.222	270.265	246.900	246.917
	1975	8464.234	2544.220	2266.968	1518.265	221.999	296.179	266.964	266.968
	1976	8651.050	2592.005	2326.112	1667.065	228.022	322.084	285.002	285.012
1977		2774.722	4.022.247	1774.576					
DEVELOPED	1972	4619.205	1656.622	176.463	1067.507	521.364	209.662	650.921	646.622
	1973	4252.247	1647.161	168.653	1007.622	146.002	200.022	511.959	517.922
	1974	4191.676	1637.212	156.476	1005.562	151.656	212.904	606.976	606.976
	1975	4197.211	1592.006	160.071	1022.127	165.945	226.612	606.500	607.261
	1976	4229.146	1726.626	167.266	1056.179	166.265	256.099	607.276	607.276
1977		1156.199	131.767	1065.597					
DEVELOPING	1972	2777.462	1177.225	2227.260	1029.792	22.277	889.871	227.279	227.279
	1973	2785.952	1217.721	2276.215	1256.969	49.212	200.261	246.276	246.276
	1974	2806.260	1212.000	2316.110	1397.272	27.277	367.751	222.269	222.269
	1975	2826.622	1257.597	2376.900	166.067	29.267	562.056	226.276	226.276
	1976	2896.190	1297.262	2437.225	126.760	22.276	577.002	227.276	227.276
1977		126.179	2592.275	168.065					
CRUDE OIL	1972	2262.922	1227.756	166.062	212.727	22.266	122.022	251.000	249.000
	1973	2402.927	1261.125	220.022	220.022	195.269	195.269	276.266	276.266
	1974	2326.666	1226.110	166.278	276.666	26.266	165.666	276.276	276.276
	1975	2406.909	1266.966	166.966	166.966	26.966	276.966	276.966	276.966
	1976	2421.722	1262.197	166.522	166.522	21.722	276.722	276.722	276.722
1977		166.626	176.266	166.266	166.266	166.266	166.266	166.266	
ASPHALT	1972	627.186	21.627	167.267	10.267	2.767	66.267	66.267	11.267
	1973	536.226	27.266	167.266	11.266	2.266	66.266	66.266	11.266
	1974	621.266	26.266	166.266	12.266	2.266	66.266	66.266	11.266
	1975	666.266	26.266	166.266	12.266	2.266	66.266	66.266	11.266
	1976	526.267	21.267	166.267	12.267	2.267	66.267	66.267	11.267
1977		165.266	6.266	166.266	166.266	166.266	166.266	166.266	
REFINED	1972	56.722	56.722	66.266	66.266	66.266	66.266	66.266	66.266
	1973	62.266	62.266	66.266	66.266	66.266	66.266	66.266	66.266
	1974	62.266	62.266	66.266	66.266	66.266	66.266	66.266	66.266
	1975	76.266	76.266	66.266	66.266	66.266	66.266	66.266	66.266
	1976	76.266	76.266	66.266	66.266	66.266	66.266	66.266	66.266
1977		66.722	66.722	66.722	66.722	66.722	66.722	66.722	
DEVELOPING	1972	622.666	5.266	667.267	10.267	1.267	26.267	26.267	6.267
	1973	667.666	5.266	667.266	11.266	1.266	26.266	26.266	6.266
	1974	616.276	5.266	666.266	12.266	1.266	26.266	26.266	6.266
	1975	621.266	6.266	666.266	12.266	1.266	26.266	26.266	6.266
	1976	666.266	6.266	666.266	12.266	1.266	26.266	26.266	6.266
1977		6.726	666.266	21.266	1.266	26.266	26.266	6.266	
ASPHALT	1972	66.267	6.267	76.267	6.267	0.267	6.267	6.267	6.267
	1973	62.266	6.266	76.266	6.266	0.266	6.266	6.266	6.266
	1974	76.266	6.266	76.266	6.266	0.266	6.266	6.266	6.266
	1975	61.266	6.266	76.266	6.266	0.266	6.266	6.266	6.266
	1976	71.267	6.267	76.267	6.267	0.267	6.267	6.267	6.267
1977		76.266	76.266	76.266	76.266	76.266	76.266	76.266	
ASPHALT	1972	166.267	166.267	166.267	166.267	166.267	166.267	166.267	166.267
	1973	166.266	166.266	166.266	166.266	166.266	166.266	166.266	166.266
	1974	112.266	112.266	166.266	166.266	166.266	166.266	166.266	166.266
	1975	112.266	112.266	166.266	166.266	166.266	166.266	166.266	166.266
	1976	165.266	165.266	166.266	166.266	166.266	166.266	166.266	166.266
1977		166.266	166.266	166.266	166.266	166.266	166.266	166.266	
ASPHALT	1972	0.267	0.267	0.267	0.267	0.267	0.267	0.267	0.267
	1973	0.266	0.266	0.266	0.266	0.266	0.266	0.266	0.266
	1974	0.266	0.266	0.266	0.266	0.266	0.266	0.266	0.266
	1975	0.266	0.266	0.266	0.266	0.266	0.266	0.266	0.266
	1976	0.266	0.266	0.266	0.266	0.266	0.266	0.266	0.266
1977		0.266	0.266	0.266	0.266	0.266	0.266	0.266	
ASPHALT	1972	0.267	0.267	0.267	0.267	0.267	0.267	0.267	0.267
	1973	0.266	0.266	0.266	0.266	0.266	0.266	0.266	0.266
	1974	0.266	0.266	0.266	0.266	0.266	0.266	0.266	0.266
	1975	0.266	0.266	0.266	0.266	0.266	0.266	0.266	0.266
	1976	0.266	0.266	0.266	0.266	0.266	0.266	0.266	0.266
1977		0.266	0.266	0.266	0.266	0.266	0.266	0.266	
ASPHALT	1972	0.267	0.267	0.267	0.267	0.267	0.267	0.267	0.267
	1973	0.266	0.266	0.266	0.266	0.266	0.266	0.266	0.266
	1974	0.266	0.266	0.266	0.266	0.266	0.266	0.266	0.266
	1975	0.266	0.266	0.266	0.266	0.266	0.266	0.266	0.266
	1976	0.266	0.266	0.266	0.266	0.266	0.266	0.266	0.266
1977		0.266	0.266	0.266	0.266	0.266	0.266	0.266	
ASPHALT	1972	0.267	0.267	0.267	0.267	0.267	0.267	0.267	0.267
	1973	0.266	0.266	0.266	0.266	0.266	0.266	0.266	0.266
	1974	0.266	0.266	0.266	0.266	0.266	0.266	0.266	0.266
	1975	0.266	0.266	0.266	0.266	0.266	0.266	0.266	0.266
	1976	0.266	0.266	0.266	0.266	0.266	0.266	0.266	0.266
1977		0.266	0.266	0.266	0.266	0.266	0.266	0.266	
ASPHALT	1972	0.267	0.267	0.267	0.267	0.267	0.267	0.267	0.267
	1973	0.266	0.266	0.266	0.266	0.266	0.266	0.266	0.266
	1974	0.266	0.266	0.266	0.266	0.266	0.266	0.266	0.266
	1975	0.266	0.266	0.266	0.266	0.266	0.266	0.266	0.266
	1976	0.266	0.266	0.266	0.266	0.266	0.266	0.266	0.266
1977		0.266	0.266	0.266	0.266	0.266	0.266	0.266	

COMMERCIAL BANKS - BY COUNTRY OF AREA  
 ON 12/31/1968 AND IS LISTED BY CAPITAL

TABLE 2

TOTAL COMMERCIAL BANKS BY STATE	TOTAL COMMERCIAL BANKS PER CAPITAL	CUMULATIVE		TOTAL AS	TOTAL ASSETS	TOTAL LIABILITIES	TOTAL CAPITAL
		ASSETS	LIABILITIES				
2,200,000	100%	2,200,000	2,200,000	100%	100%	100%	100%
1,800,000	81%	1,800,000	1,800,000	81%	81%	81%	81%
1,500,000	68%	1,500,000	1,500,000	68%	68%	68%	68%
1,200,000	54%	1,200,000	1,200,000	54%	54%	54%	54%
1,000,000	45%	1,000,000	1,000,000	45%	45%	45%	45%
800,000	36%	800,000	800,000	36%	36%	36%	36%
600,000	27%	600,000	600,000	27%	27%	27%	27%
400,000	18%	400,000	400,000	18%	18%	18%	18%
200,000	9%	200,000	200,000	9%	9%	9%	9%
100,000	4%	100,000	100,000	4%	4%	4%	4%
50,000	2%	50,000	50,000	2%	2%	2%	2%
25,000	1%	25,000	25,000	1%	1%	1%	1%
10,000	0.5%	10,000	10,000	0.5%	0.5%	0.5%	0.5%
5,000	0.2%	5,000	5,000	0.2%	0.2%	0.2%	0.2%
2,500	0.1%	2,500	2,500	0.1%	0.1%	0.1%	0.1%
1,000	0.05%	1,000	1,000	0.05%	0.05%	0.05%	0.05%
500	0.02%	500	500	0.02%	0.02%	0.02%	0.02%
250	0.01%	250	250	0.01%	0.01%	0.01%	0.01%
100	0.005%	100	100	0.005%	0.005%	0.005%	0.005%
50	0.002%	50	50	0.002%	0.002%	0.002%	0.002%
25	0.001%	25	25	0.001%	0.001%	0.001%	0.001%
10	0.0005%	10	10	0.0005%	0.0005%	0.0005%	0.0005%
5	0.0002%	5	5	0.0002%	0.0002%	0.0002%	0.0002%
2	0.0001%	2	2	0.0001%	0.0001%	0.0001%	0.0001%
1	0.00005%	1	1	0.00005%	0.00005%	0.00005%	0.00005%



CORPORATE SERVICES RECEIVED	
12/17/77	
100	100
100	100
100	100
100	100
100	100
100	100
100	100
100	100

## Head Office Management Letter

### SHELL WITHDRAWS FROM SHALE PROJECTS

Shell today notified Ashland Oil, Inc., of its intention to withdraw from the federal oil shale project on tract C-b in northwestern Colorado. Ashland is Shell's equal partner in the C-b project. Shell has been project operator since late 1975.

Shell also announced that it would cease participation in another shale oil venture, the Colony Development operation on private land in Colorado. Other Colony partners having 25 percent interests are Ashland, Atlantic Richfield Co., and TOSCO.

The Company based its decision on an evaluation of the economic, political, environmental, and technical considerations in the near term.

However, Shell still views oil shale as one of the many potential sources for future energy. The Company has an oil shale position on other Colorado lands which it owns and will maintain, even though development is not contemplated at this time.

Today's action in no way diminishes Shell's resolve to develop alternate energy sources, which are so vital to this nation, and the Company will continue to participate in the development of coal and solar energy interests as rapidly as possible.

Shell has asked that the C-b partnership agreement be dissolved on or before December 31, 1977.

Both companies, including Ashland, will receive a bonus bid of \$117.8 million for the land in 1977.

\*\*\*

No. 197

Nov. 16, 1976

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SHELL OIL COMPANY

REFERENCE

## SHELL OIL COMPANY

DATE OCTOBER 6, 1976

TO EXECUTIVE VICE PRESIDENT  
EXPLORATION AND PRODUCTION (4)

FROM GENERAL MANAGER  
MINING VENTURES

SUBJECT POSITION PAPER ON OIL SHALE

This position paper has been prepared as background information for a management decision on continued development or liquidation of our oil shale assets. The paper presents our analysis of available options and recommends liquidation of most of these reserves.

Shell presently has a 50% interest in Federal lease Tract C-b from which our share of recoverable reserves would be 160 MM barrels by current recovery technology. The huge initial project investment required, unfavorable economics, and political-environmental uncertainties led to a decision in June, 1976, to dispose of our interest in Tract C-b.

Occidental Petroleum, in concert with Ashland, have recently proposed to develop Tract C-b using their modified in-situ process. They would contribute their technology for a 1/3 share of the project. Development costs through the demonstration stage, which is needed prior to a decision on commercialization, are estimated at \$20 million (Shell's share) spread over four to five years. A substantial commitment of managerial and technical talent would also be required. Inability to offset the fourth and fifth bonus payments could add up to \$15 million to this cost, bringing the total exposure in the range of \$20 million minimum up to a possible maximum of \$40 million.

The modified in-situ process has a definite potential to significantly improve the economic viability of the C-b Project, particularly when used in combination with surface retorting of the mined-out shale. Notwithstanding this, our recommendation is to relinquish the C-b lease. The reason for this conclusion is that in order to significantly improve our confidence in a commercial investment decision, we would have to continue through the Demonstration Phase at a cost to Shell in the probable range of \$20 to \$40 million. The technical risks are high. Furthermore, even assuming the technical problems can be solved in a manner that makes the project economically viable, continuation remains in jeopardy of serious delay or cancellation due to political factors such as divestiture legislation and prohibitive environmental legislation. The totality of all these risks counsel against further expenditures.

Our interest in the Colony project consists of the development technology and engineering plus an option on 25% of the Dow-Colony reserves, estimated at 155 MM barrels of recoverable shale oil. Withdrawal from this project is also recommended. We could probably reenter this venture at a later date with little added cost if it becomes desirable to do so.

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EXECUTIVE VICE PRESIDENT  
EXPLORATION AND PRODUCTION

2

Shell's fee lands, although dispersed, cover 4700 acres containing more than 140 MM barrels of recoverable shale oil. These reserves should be retained. Their holding costs are negligible and their sale or exchange value should increase appreciably if other shale projects proceed to successful commercialization.



APG:CC

Attachments

cc - (w/attachments)

Exploration and Production  
Vice President - Production (2)

Shell Development Company  
President  
Vice President

bc - (w/attachments)

Messrs. H. J. Edwardson  
N. J. Isto  
J. K. Spangler  
W. J. Devereux  
C. E. Nadeau

PRIVATE AND CONFIDENTIALPOSITION PAPER ON OIL SHALE

In June, 1976, the CEO eliminated funds for oil shale from the long term plan and instructed Mining Ventures to dispose of Shell's interest in Tract C-b in the most advantageous way. Reconsideration of Shell's current and long-term interest in the development of shale oil has been precipitated by an agreement between Ashland, our partner in the C-b Project, and Occidental Petroleum (Oxy) to attempt the development of the C-b Tract using the Oxy modified in-situ process. This paper provides background information for a decision in response to the Ashland/Oxy agreement as well as our position with regard to other oil shale properties.

Shell's Assets in Oil Shale

Shell's oil shale assets include fee lands, a 50% interest in the C-b Tract, a 25% interest in the Colony Project, an option to purchase a 25% interest in the Colony reserves, and some technology.

The reserve holdings are tabulated below:

<u>Oil-in-Place (MMB)</u>			
<u>Tract</u>	<u>Acres</u>	<u>Mahogany</u>	<u>Total</u>
C-b (50%)	2547	420	2406
Fee Strips	2244	370	2583
Red Pinnacle(fee)	4445	195	270
<b>TOTAL</b>	<b>9236</b>	<b>985</b>	<b>5257</b>

In addition, the Colony option would net Shell 2,209 acres containing 268 MMB oil-in-place, or 155 MMB recoverable reserves.

The technology consists of Shell's in-situ process, several patents, and a recently researched, but not yet developed, surface retorting process. This technology is not considered material to the decision at hand.

Shell's fee land position also is not considered material to the present decision. The fee strips, though containing rich oil shale, are too small and scattered to be developed economically as is; their potential value

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lies mainly in exchanging for other lands to block up into a viable mining unit. The Red Pinnacle land, though larger, contains insufficient high grade shale (50 ft. interval containing at least 30 gal/ton) to be economically viable at present.

The attached maps, Figures 1 and 2, indicate the location of all of Shell's oil shale assets.

#### C-b Project

Shell, Atlantic Richfield, Ashland and TOSCO were the successful bidders for the 5100 acre Tract C-b in the February, 1974 Federal lease sale. Atlantic Richfield served as operator initially, but resigned effective June 1, 1975, when Shell became operator. At year end 1975, both Atlantic Richfield and TOSCO withdrew, assigning their interests to Shell and Ashland, who have continued the project at a sharply reduced level. Our strategy at that time was to hold our interest in Tract C-b with a minimum of expenditures until such time as we were encouraged to move forward with the project.

In February, 1976, the completed ODP\* was submitted to Interior. This document described four phases of development and anticipated environmental impacts. Phase I included 1 year for final engineering design work and 4 years for mine development. A room-and-pillar mine in a selected interval of the Mahogany Zone was described. Phase II allowed another 4 years for construction of a 50,000 barrel per day commercial plant utilizing the TOSCO II retorting process, coking of the heavy oil stream, and high-severity hydrotreating of the oil product. Phase III described commercial operations and Phase IV the disposition of the complex at the end of the project and anticipated land rehabilitation plans.

At the time of the lease sale, recovery of about 50% of the full Mahogany Zone mining interval was anticipated. Subsequent core hole data indicated weaker rock structures than had been expected which reduced the recovery factor to about 35%. This has a serious adverse effect on the economic viability of the project. The primary reason for the extended mine development program was to resolve the rock mechanic problems and optimize the mine design for increased recovery.

In March, 1976, a request for an 18-month suspension of the lease was submitted to Interior. Part of the justification for this request was to allow time to study alternate mining methods that would increase the resource recovery. A 12-month suspension was granted in September, 1976, with the stipulation that certain environmental monitoring activities must continue after the two-year baseline studies are completed in November. Total project costs have recently been about \$100 000 per month. After November, these total (100%) project costs will be reduced to about \$65,000 per month, of which approximately 1/2 are related to the continued environmental monitoring requirements. The suspension may be extended by the Area Oil Shale Supervisor (AOSS) of the Department of Interior.

\* Detailed Development Plan

The winning bid for Tract C-b was \$117.8 million, payable in five annual installments beginning April 1, 1974. The first three installments are mandatory, and have been paid. The fourth and fifth installments may, with approval of the Secretary of the Interior, be avoided by surrendering the lease prior to the next (third) anniversary date. With the 12-month suspension, the effective due date for the fourth payment has been deferred until April 1, 1978. It is important to note the opinion of the Dept. of Interior solicitor's office that both the fourth and fifth bonus payments become mandatory if the lease has not been surrendered by the third anniversary date. The fourth and fifth bonus payments may be offset by certain project development work, subject to approval by the AOSS. This work must be pursuant to an approved DDP, expenditures must be directly attributable to operations under the lease, and must actually be used in development.

Interior had intended to grant approval of the DDP soon after granting the suspension. However, in the face of pre-election political pressures, and strong opposition by environmental groups and by the office of Governor Lamm of Colorado, it is now uncertain when the DDP will be approved. Certain environmental groups seem determined to block the development of oil shale. The Governor's office claims that approving the DDP during the suspension would work to deprive the state of its 37.5% share of the fourth and fifth bonus payments by allowing the lessees extra time to accomplish development work creditable against the last two bonus payments. This state argument is dubious because it was never intended by the lessees or Interior officials that the last two bonus payments would be in cash; furthermore, it was not the original intent of State officials.

The AOSS has indicated in a letter of September 9, 1976, that no expenditures made during the suspension period will be allowed for bonus credit, with the sole exception of the environmental monitoring required as a condition of the suspension. This decision represents a serious impediment in our ability to offset the fourth bonus payment. It would require spending \$23.6 million in approved development work during the seven months remaining after the suspension is lifted and prior to the due date for the fourth bonus payment, currently April 1978. The only realistic way this could be achieved would be by completion of required engineering design work (e.g. for mine shafts, roads, dams, etc.), at a cost of \$1 to 2 million, prior to the end of the suspension period so that field work could commence immediately thereafter. The design costs may not be creditable for bonus offset by this scenario, but prepayment of expenditures may be allowed and could be helpful.

This time constraint is made more serious because the C-b Project completely dismantled its development capability and cancelled engineering contracts earlier this year. This was in response to the Shell and Ashland decision to cut the project staff and expenditure rate to a bare minimum when Atlantic Richfield and TOSCO withdrew from the project.

Continuing with the project incurs a serious risk that at least some portion of the fourth bonus payment will have to be made in cash. However, the option of relinquishing the lease shortly after the suspension period (but before the third anniversary date) and obtaining at least the tax advantage attributable to a capital loss would still be available.

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There is a further substantial risk that the fifth bonus payment of \$23.6 million may also have to be paid in cash. This risk is two-fold. First, the solicitor's opinion mentioned above means that the lease cannot be relinquished after the third anniversary date without the lessees being liable for both the fourth and fifth bonus payments. Second, Department of Interior guidelines specify that a bonus offset credit for equipment purchased would be disallowed retroactively if that equipment were not actually used on the project, and that the lessees would be required to repay the bonus amount in cash with interest. This logic would well be applied to a situation in which the lessees conducted good-faith development work such as the sinking of mine shafts, etc., only to have the project fail later for any reason whatsoever. This could mean that the lessees would be in double jeopardy--to spend the equivalent of the two bonus payments in legitimate development work, and still be required to pay the bonuses in cash with interest. The AOSS has stated that expenditures for equipment and services for development of the tract, following the path of an approved DDP, would be considered by the Government as proper bonus offset allowances even if the project failed, so long as a "good-faith" effort was demonstrated. Again, it is risky to rely on such verbal assurance. While we have confidence in Interior's intent, it is nonetheless subject to possible challenge.

Shell's expenditures for the C-b Project through July, 1976 total \$21.4 million. Details are given in Table 1. Shell's share of current expenditures are at an annual rate of \$600,000 to the end of 1976 and \$400,000 during the suspension period.

#### Occidental Proposal

Upon learning of Shell's intent to dispose of the C-b lease, Ashland pursued an alternate development plan with Oxy. Agreement was reached on August 10, 1976, between Ashland and Oxy to attempt the joint development of the C-b tract using Oxy's modified in-situ process, and to invite Shell to join as an equal 1/3 partner under the same conditions. An outline of this Agreement is given in the Appendix. Oxy would contribute its process rights and know-how for use only on C-b, while Ashland (and Shell) would contribute the C-b lease and all past project and lease expenditures, data and know-how. Future expenditures would be shared equally. Shell was formally notified of this agreement in a letter of September 3, 1976, and invited to participate. Under the current C-b Partnership Agreement, Shell has 90 days to respond under the Transfer of Interest clause. If Shell declines, Ashland and Oxy may choose to proceed with a Modular Development at no risk to Shell. Our interest would subsequently be diluted in proportion to total project expenditures. We would retain an option to rejoin at any time during the modular development (or demonstration phase) at double our normal share of the allocated costs. This probably would not be acceptable to

Oxy. It also is preferable for Shell to reach a clear decision on continuing or withdrawing at the earliest possible time to assure 1976 income tax benefits of \$8.5 million.

Oxy have examined the C-b geology, hydrology, and other technical data and declared in writing their conclusion that the Oxy process is applicable to the C-b tract. Ashland is committed to examine the Oxy process data and test operations under secrecy agreement and to declare within three months whether they intend to participate in the on-site demonstration phase of the Oxy process. If not, then Oxy has the right to proceed on a sole risk basis, and Ashland can recover its investment out of 2X of future gross sales, with no interest.

There are potential problems, which may be difficult to resolve, in reaching agreement with Oxy on the terms of a joint venture. First, the Oxy secrecy agreement contains onerous clauses that our Patents and Licensing (P&L) organization find objectionable. These include (a) a 15-year secrecy obligation, (b) a broad definition of confidential information that could include verbal information (which may be difficult to prove was already in Shell's possession), and (c) separate individual secrecy agreements in addition to the Company agreement. P&L has drafted an alternative agreement for negotiation, if needed. Second, a new Partnership Agreement cannot be made with Oxy and Ashland until after the evaluation. A new agreement could cause a loss of part of the tax advantage if we chose not to proceed. Nevertheless, suitable business terms must be resolved with Oxy in advance to avoid later conflict.

#### Project Evaluations

The development plan presented in the C-b Project DDP is based on room-and-pillar mining in the Mahogany Zone only, surface retorting, coking of residue, and severely hydrotreating the shale oil and coker distillates. An alternative would be to limit on-site processing to coking of the residue and mild hydrostabilization of the oil product. Retorting alternatives include a modified in-situ process alone or in combination with surface retorting of the mined-out shale.

These results indicate a clear incentive to limit the on-site processing to coking and hydrostabilization. Optimum processing

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of this high nitrogen syncrude in existing refineries will need further pilot plant tests and evaluation of any required refinery modifications.

The evaluation of a modified in-situ and surface retorting combination is based on our own concept of this system. The mining design and in-situ cost estimates were taken from a study by Fenix and Scisson, Inc. under contract to the Bureau of Mines and adjusted to the C-b tract. Surface retorting of the mined-out shale was based on TOSCO II retorts. This combination shows good promise of significantly improving the project profitability. However, the "combination" approach has the added risk of using two unproven retort technologies, surface and in-situ, unless surface retort modules are developed first on other projects. This in-situ calculation is based on a mine design that achieves 40% areal recovery from a mining zone. A more detailed presentation of this evaluation of combined in-situ and surface retorting is contained in the attached report.

A major factor contributing to the possible cost advantage of the Oxy modified in-situ process is their claim of 60% areal recovery by rubbleizing to achieve a tightly packed retort. This also permits deeper retorts which further increases the resource recovery. They are the only company that has demonstrated operation of a 120 x 120 x 270 ft. commercial size retort. Overburden at their test site is believed to be in the range of 400 to 600 ft. Oxy are very secretive about hard, factual results of these tests. Based on previous claims concerning their process, we believe their estimates of resource recovery and costs are very optimistic. Nevertheless, if certain basic claims could be substantiated, recovery of 800 million to 1 billion barrels of oil from Tract C-b might be realized and costs could be materially reduced below our estimates.

#### Options

The apparent alternatives for Tract C-b are (a) to relinquish the lease, (b) to evaluate the Oxy modified in-situ process with intent to proceed to a joint venture with Ashland and Oxy if a detailed analysis and cost estimate warrant commercial development, or (c) to decline the Oxy proposal but retain our interest in the C-b lease. The pros and cons of these options follow:

(a) Abandoning our interest in the C-b lease and quitclaiming to Ashland would reduce Shell's income tax payments during the following year by \$8.5 million. Sale or exchange for some other asset is being considered, but no sale for equal or better value than the tax write-off is imminent or likely to be offered. Giving up the richest of Shell's shale assets implies withdrawal from shale developments for the foreseeable future.

(b) Proceeding with evaluation and development of the modified in-situ process commits Shell to some added cost during the evaluation period with exposure and risk escalating rapidly if we continue to the Demonstration Phase. Evaluation requires signing a secrecy agreement with Oxy to permit review of their background tests and other information. Unresolved objections to Oxy's secrecy agreement were previously discussed. If we should sign a secrecy agreement but subsequently decide not to proceed with in-situ development of Tract C-b, we could be tied to the Oxy technology for an extended period of time (10 or 15 years). If Shell elected to undertake other shale oil ventures during this time period, it could require payment of a substantial license fee to Oxy. We understand Oxy presently are asking \$30 million for a paid-up license.

We would also have to share the cost of an Engineering Plan and cost estimate, although we would insist on retaining the right to relinquish the lease after review of the Oxy data, if further evaluation were not warranted. Costs during this period, estimated to last 6-9 months, would be a 1/3 share of continuing C-b Project costs, 1/3 of the Engineering Plan cost, and the interest value of deferring the tax write-off for 1 year. These total approximately \$1.2 million. In addition, an estimated 24 man-months of Shell engineering manpower will be required for the evaluation.

On-site demonstration of the modified in-situ process would be required to reduce the risk of commercial operation, assuming the evaluation justified continuation. A definitive cost estimate for this demonstration has not been made, but \$40 to \$70 million is the likely range. A decision to proceed with the Demonstration Phase very likely will have to be made in the absence of a clear resolution of the bonus offset problem discussed earlier. Using the in-situ process requires modification and approval of a revised DDP which would further aggravate the time constraint for bonus offset work. Therefore, at least part of the final two bonus payments, totaling \$47.1 million, must be considered a potential added cost. Shell's share of the total exposure for demonstration and bonus payment could be \$30 to \$40 million. A major commitment of managerial and technical manpower (primarily research, process design and construction engineers) would also be required. The actual number will depend on whether Oxy is accepted as Operator and the manpower contributions by Ashland and Oxy.

If the evaluation step indicates Oxy has achieved a potentially significant improvement in in-situ retort technology, the Demonstration Phase would still be required to increase our confidence level sufficiently to proceed to commercialization. Therefore, a Shell decision to proceed now should include a willingness to participate in the Demonstration Phase, with its implied commitment of money and manpower.

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(c) The third option is to decline participation in in-situ development, but retain our interest in Tract C-b. The present C-b Partnership Agreement includes a "sole risk" option for the "Modular Approach" to developing the Tract. Shell could rejoin at any time prior to commercialization by payment of 200% of our normal share of the costs. We understand that Oxy rejected proposals for similar buy-back provisions in their agreement with Ashland. Unless there is a change in attitude by Oxy, they will likely cancel their agreement with Ashland rather than accept this buy-back option by Shell. We believe Shell has a sound legal basis for this option. Nevertheless, our relations with Ashland would certainly sour if Oxy cancelled their agreement due to Shell's position on this matter. Assuming such cancellation, Shell would then be obligated for its share of continuing project costs, estimated at \$400,000 for the one-year suspension period, plus the interest value of deferring the tax write-off.

What would Shell gain by exercising this option? Only time, in the hope that economic, political and environmental problems might be resolved during the suspension period - a highly unrealistic hope. If Oxy cancels their agreement, we are no further along in making the project economically viable. However, if Oxy should proceed with Ashland on a sole risk basis, we would retain the option to rejoin at double the normal cost. The success of Oxy and Ashland in offsetting the 4th and 5th bonus payments would substantially affect the cost to rejoin. Nevertheless, this option warrants serious consideration in the hope, however slim, that Oxy will proceed under the terms of their agreement with Ashland. If the Demonstration Phase cost is say \$60 million and Oxy/Ashland succeed in offsetting the last 2 bonus payments, Shell's cost to rejoin at the end of the Demonstration Phase would be \$60 million for a 50% share of the project. Our bargaining power would be lost, so Oxy presumably would remain as Operator for commercialization and we would not be able to get an extension of Oxy's license rights to other projects.

A fourth option that was briefly considered was to develop the modified in-situ process ourselves or in conjunction with other companies. However, it is believed that it would take us several years and a considerable investment of money and manpower to reach the equivalent state of development and know-how held by Oxy. Since we are seeking additional partners to share the risk of the project in any case, bringing Oxy in on the basic premise of trading a 1/3 share of the project for their know-how appears to be equitable. If a decision is made to stay in the oil shale business, we conclude it would be preferable to proceed with Oxy than try to catch up on our own.

#### Other Problems

Beyond the technical and economic risks outlined above are a myriad of political and environmental factors which cast additional doubt on the opportunity to develop a successful shale oil facility. These factors range from threats of both horizontal and vertical dismemberment to various proposals being considered by Congress to amend the Clean Air Act in ways which could bar any significant industrial development in vast regions of the western states. Even though the immediate threat of Clean Air Act amendments appears to have been thwarted for the current session of Congress by a successful Senate filibuster, renewed efforts are anticipated in 1977. In any event, enforcement of present Significant Deterioration regulations could have the same effect. In addition, other air and water quality standards may be difficult to maintain and are likely to serve as a basis for environmental litigation. While we believe the environ-

metal roadblocks being created by Congress, the State and various environmental groups will eventually yield to pressures for further energy development, the attendant uncertainties make the C-b Project far less attractive than a strict technical assessment might otherwise suggest. It is, therefore, the totality of risks involved which clearly reduces our confidence for an investment of the required magnitude. We view these risks as perhaps the biggest deterrent to any commercially viable shale oil project.

#### Colony Project

Shell acquired a 25% interest in the Colony project, together with Atlantic Richfield (operator), Ashland and TOSCO in February, 1974. In addition, Shell has an option, which expires in December, 1976, to purchase a 25% undivided interest in 620 MM barrels of Colony reserves presently held in fee by Atlantic Richfield and TOSCO. Water rights are not included, although the option agreement does provide that a share of the water rights held by Atlantic Richfield and TOSCO will be sold to Shell at a fair market price if the option is exercised.

The project is based on underground mining and surface retorting using the TOSCO II process and producing 47,000 B/D of premium quality syncrude plus LPG. A definitive engineering design and cost estimate was completed by C. F. Braun in late 1974 at a cost of about \$12 million. This project would require a capital investment of \$900 million in 1976 dollars, excluding reserve acquisition costs. Pending funding by the partners, the project could have started field construction in May, 1975. Instead, the project was suspended in late 1974 because of unsatisfactory economics and the risk of proceeding in the absence of a realistic national energy policy.

Shell's investment in the Colony Project through July, 1976, is \$9.7 million. A breakdown of these costs is given in Table 2.

The chance of recovering any portion of these costs is considered remote. The option agreement provides that, should any third parties enter the project within five years from the option agreement date of August, 1975, then Shell is entitled to receive a pro rata share of any payments made by the third parties for the past project costs. Shell is not required to continue paying project costs in order to keep this reimbursement provision in effect.

Of all the oil shale projects known, on either private or leased land, the Colony project is considered the most advanced in terms of detailed design and engineering. If economic and other obstacles were removed, it could possibly be in production within four to five years of a decision date. TOSCO has been seeking Federal loan guarantees and other forms of Government assistance for this project, thus far without success.

If desired, participation in the Colony project could be continued at a bare-bones minimum expenditure (Shell's share) of about \$200,000 per year. On the other hand, there is relatively little to be gained for Shell by even this modest level of expenditure. Should the project go to commercialization, Shell

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would presumably be welcome as a participant at that time, and the resource acquisition cost would hardly be higher than under the present option. Also, the five year provision for cost recovery from payments by third parties entering the project would apply whether Shell continued to contribute to project costs or not.

#### Summary and Recommendations

Shell presently has a 50% interest in Federal lease Tract C-b from which our share of recoverable reserves would be 160 MM barrels by current recovery technology. The huge initial project investment required, unfavorable economics, and political-environmental uncertainties led to a request for suspension which was granted on September 1, 1976. Nevertheless, these obstacles are not likely to be favorably resolved in the near future. This conclusion led to a decision in June to dispose of our interest in Tract C-b.

Occidental Petroleum, in consort with Ashland, have now proposed to develop Tract C-b using their modified in-situ process. They would contribute their technology for a 1/3 share of the project. Development costs through the demonstration stage, which is needed prior to a decision on commercialization, are estimated at \$20 million (Shell's share) spread over four to five years. A substantial commitment of managerial and technical talent would also be required. Inability to offset the fourth and fifth bonus payments could add up to \$15 million to this cost, bringing the total exposure in the range of \$20 million minimum up to a possible maximum of \$40 million.

Our principal options in response to the Oxy proposal are:

- a) relinquish the lease now and recover \$8.5 million as a tax write-off,
- b) proceed with Oxy through the on-site demonstration tests to a decision point on commercialization, or
- c) reject the Oxy proposal, but attempt to hold the lease.

These options, along with estimated costs and related time periods, are shown diagrammatically in Figure 3.

The modified in-situ process has a definite potential to significantly improve the economic viability of the C-b Project, particularly when used in combination with surface retorting of the mined-out shale. Notwithstanding this, our recommendation is to relinquish the C-b lease. The reason for this conclusion is that in order to significantly improve our confidence in a commercial investment decision, we would have to continue through the Demonstration Phase at a cost to Shell in the probable range of \$20 to \$40 million. The technical risks are high. Furthermore, even assuming the technical problems can be solved in a manner that makes the project economically viable, continuation remains in jeopardy of serious delay or cancellation due to political factors such as divestiture legislation and prohibitive environmental legislation. The totality of all these risks counsel against further expenditures.

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Our interest in the Colony project consists of the development technology and engineering plus an option on 25% of the Dow-Colony reserves, estimated at 155 MM barrels of recoverable shale oil. Withdrawal from this project is also recommended. We could probably reenter this venture at a later date with little added cost if it becomes desirable to do so.

Shell's fee lands, although dispersed, cover 4700 acres containing more than 140 MM barrels of recoverable shale oil. These reserves should be retained. Their holding costs are negligible and their sale or exchange value should increase appreciably if other shale projects proceed to successful commercialization.

October 1, 1976

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TABLE 1

Shell Share of C-b Project Costs  
((\$1,000))

	<u>1974</u>	<u>1975</u>	thru July <u>1976</u>	<u>Total</u>
Lease Bonus	5,889	5,889	5,889	17,667
Staff and Overhead	90	644	446	1,180
Operations	<u>501</u>	<u>1,355</u>	<u>664</u>	<u>2,520</u>
TOTAL	6,480	7,888	6,999	21,367

TABLE 2

Shell Share of Colony Costs  
((\$1,000))

	<u>Buy-in</u> <u>(Pre-1974)</u>	<u>1974</u>	<u>1975</u>	thru July <u>1976</u>	<u>Total</u>
Land Costs	-	556	2	8	556
Staff	-	780	221	122	1,123
Operating	<u>3,291</u>	<u>4,169</u>	<u>414</u>	<u>170</u>	<u>8,044</u>
TOTAL	3,291	5,505	637	300	9,733

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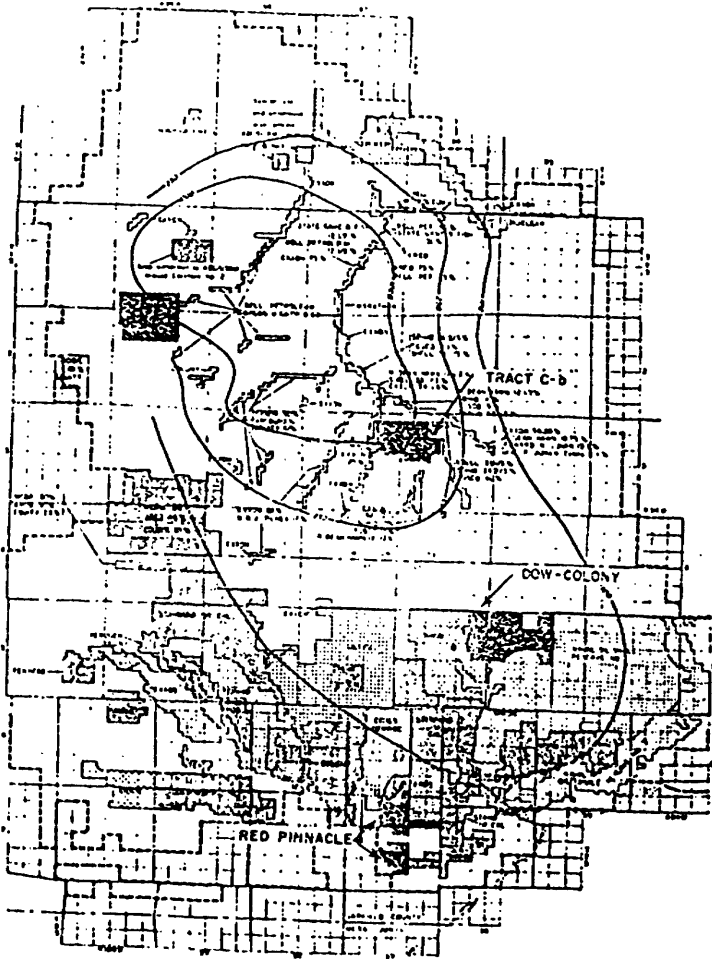


FIGURE 1

SNELL OIL COMPANY	MINING VENTURE DEPARTMENT
<b>LAND MAP</b> <b>PICEANCE BASIN</b> <b>COLORADO</b>	

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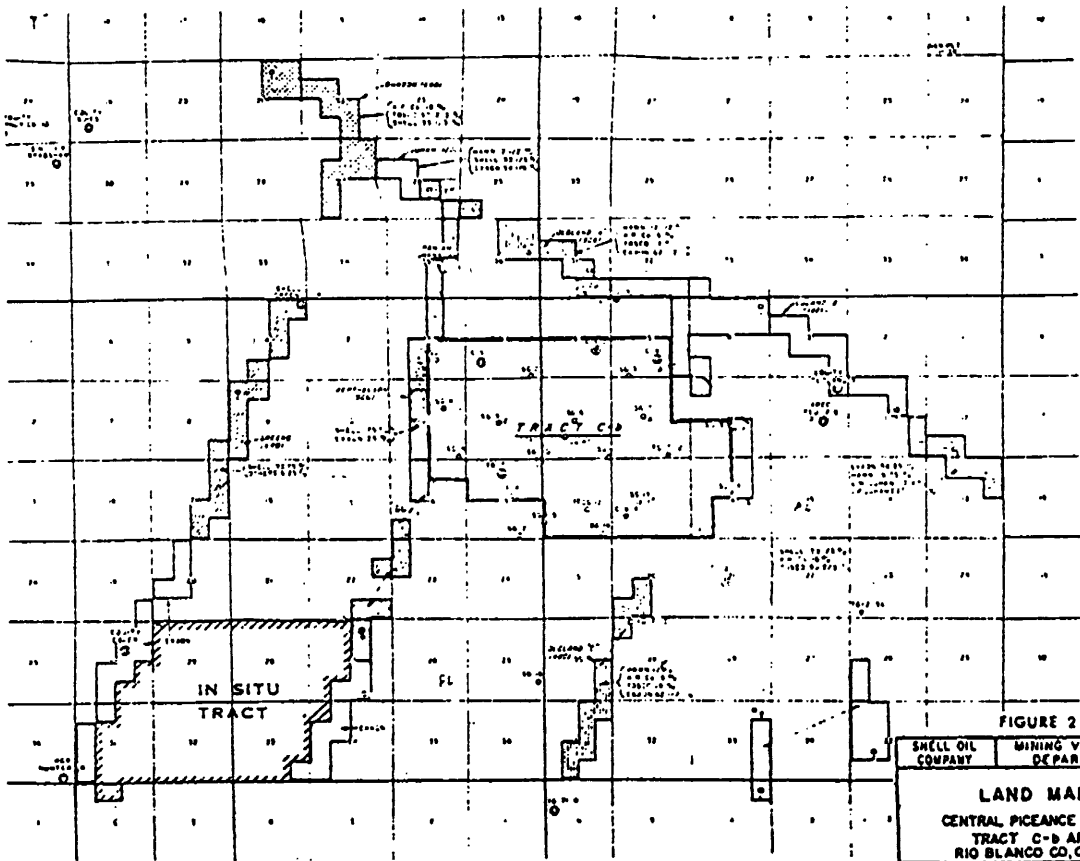
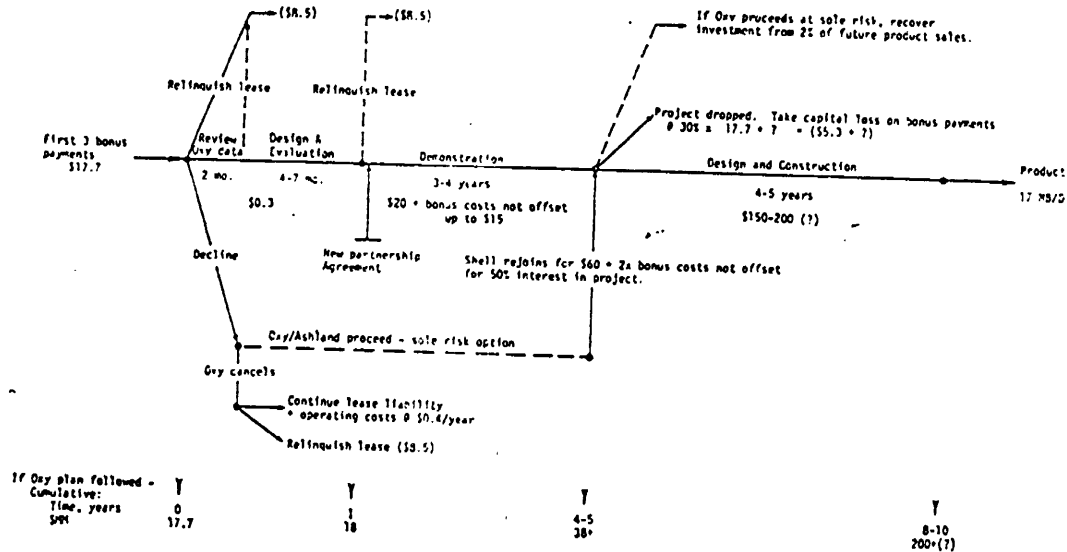


FIGURE 2

SHELL OIL COMPANY	MINING VENTURES DEPARTMENT
LAND MAP	
CENTRAL PICEANCE BASIN	
TRACT C-b AREA	
RIO BLANCO CO., COLORADO	

100-1-76 10-4

FIGURE 3  
SHELL OPTIONS ON C-6 TRACT  
 (\$ MILLIONS)



Notes:- Shell's approximate costs (credit) given in \$ million.  
 - The interest value of foregoing a tax write-off by surrender of the lease is not included in these costs.  
 - Time delays for political-environmental reasons would add to costs and time schedule.

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ASHLAND/OCCIDENTAL AGREEMENTAUGUST 10, 1976

Objective: Develop C-b using Oxy modified in-situ process

Terms: (1) Ashland contributes 1/2 of its interest in C-b, including all information, plans, etc.

(2) Oxy contributes use of proprietary process and is Operator.

(3) All joint venture costs shared equally.

(4) To evaluate project, Ashland will receive Oxy confidential information under secrecy agreement and will share cost of preparing engineering plan estimated at \$100,000 to \$200,000. Ashland then has three months to decide on participation.

(5) After evaluation:

(a) If Oxy declines to proceed, all rights reassigned to Ashland.

(b) If Ashland declines to proceed and Oxy proceeds at sole risk, Ashland may

(1) Waive all residual interest except to recover investment (\$22 MM) from 2% of future sales over 8 years. Oxy assumes all future obligations.

(2) Reserve its rights. Under certain conditions of non-performance by Oxy, Ashland may recover full or partial interest. Also may recover investment from 2% of sales.

(6) If Oxy elects sole risk operation, it must spend minimum \$30 MM over four years for demonstration test.

(7) No other project may be carried out prior to cessation of modified in-situ operation.

(8) Shell will be afforded opportunity to participate as equal partner under terms of agreement. If Shell declines, Ashland will attempt to renegotiate C-b Partnership Agreement.

(9) Oxy can cancel if Shell's position not resolved in two weeks.

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Senator GRAVEL. Our next witness, Mr. Jack Blum, is not here at the moment.

Are you here, sir?

Mr. BLUM. Chairman, I regret I do not have a prepared statement. I have been in California for the past 2 weeks talking to my members about the gasoline crisis. We were invited to testify just before leaving.

I do not have a statement.

I would like to explain our situation, and I believe I can do that very briefly.

Senator GRAVEL. We will take what we can get from you

**STATEMENT OF JACK BLUM, GENERAL COUNSEL, INDEPENDENT GASOLINE MARKETERS COUNCIL**

Mr. BLUM. My name is Jack Blum, general counsel of the Independent Gasoline Marketers Council.

The Independent Gasoline Marketers Council are unbranded retail station owners. They operate in 45 of the 50 States. Most of the members of our association own a large number of retail stations. The largest member has 800 retail units and markets almost 1 billion gallons a year.

They buy gasoline from refiners and sell it at retail. Some of them have small refineries of their own.

All of them are net buyers of gasoline at the refinery rack.

We, as nonbranded independent marketers, have suffered from a tangle of Government regulation that has absolutely amazed us and crippled us in attempting to function in the present marketplace.

Senator Long put his finger on the problem very precisely a few minutes ago. His State sells crude oil for \$6 a barrel and buys back diesel fuel at \$40 a barrel.

We believe that, despite all the present Government regulations, the product prices that most people pay, both for fuel oil and gasoline—which is still price regulated—roughly approximates world market prices plus taxation in individual national situations.

What has gone on in the course of the Government regulatory program are a variety of income transfers from one level of the industry to another level of the industry. So, for example, the crude oil control program has essentially protected domestic refiners, particularly the domestic small refiner, who does not have access to worldwide supplies of crude at the same kinds of prices that the majors do.

At the same time, the small refiners who benefit have not always used that benefit to expand their refineries and have turned around and used that money in large measure to expand downstream to retail marketing.

The regulatory programs do not take any of this into account. Congress unfortunately has approached each of these issues piecemeal. Someone says we need more crude oil. All right. Let's see what we can do to help the producers of crude oil.

We need more refinery capacity. Let's see what we can do to help the people building refineries.

We need more of something else, let's see what we can do to help them.

The fact is, when these subsidies begin to come in place, they tend to defeat each other. One subsidy piled on top of another subsidy means that subsidies all compete with each other. And more often than not subsidies intended for one purpose wind up doing something else.

If you subsidize syn fuels, you are making that kind of fuel cheaper, increasing that supply, and somebody else's pet project becomes needy, and requires a subsidy of its own.

Our position on this is that it is time to end all of these subsidies for everybody and let the market price reflect the cost, and let the chips fall where they may.

To give you some example of the kind of madness we are dealing with in the market, we still have retail price control on gasoline. Gasoline prices, for anyone who can look at them, have gone up in excess of 40 percent in the last 3 months. Some increases have exceeded 60 percent.

How that can be, in a price control situation, is an absolute mystery to everyone at DOE and the White House. The answer, of course, is increasing costs.

The present control system cannot be enforced. It cannot be managed. And what is meant is an endless tangle of paperwork, bizarre transactions where retailers are forced to buy from people that they would rather not buy from and who then have no ability to sell the product they get because the price was too high.

The central question, as far as we are concerned, in the crude oil area is this. If, in fact, crude oil is decontrolled, what will happen to the domestic refining industry? The real issue in the United States right now is terms of energy shortage is a lack of capacity to manufacture unleaded gasoline, and that comes because most of the refineries in the United States have not, for the last several years, changed their configuration to manufacture the unleaded gasoline.

Not only that, because of the regulatory climate the DOE has provided, they have not changed their refining capacity to deal with the heavier, high-sulfur grades of crude oil that are coming in from around the world.

I suggest that the critical issue is how to restore some kind of market pressure on the refinery industry so that it either modernizes or goes broke, rather than to temporarily shelter it from competition with no penalties at all for nonmodernization.

We feel very, very strongly that the central problem is getting these refiners to install the necessary capacity.

As to energy independence, the record reflects that energy independence is a hopeless proposition. We have watched over the last couple of years since it was first proposed by President Nixon as a national policy. We have watched the level of imports continue to increase. Those increases will continue.

On the question of OPEC and what to do about OPEC prices, we have not had a national policy, but in the period from 1974 when OPEC prices first burst on the scene at very high levels, then tapered off and dropped because the world production did respond to the market. Worldwide production did go up.

It required a political upheaval in one sensitive spot to then shrink world production below world demand and create the climate for yet another OPEC increase.

That argues for a policy that would lay on the table a reserve that could be tapped into. For example, one idea that has occurred to us in the area of natural gas is to build that Alaskan gas pipeline, build it as a reserve, a standby reserve, so that at some future time when the King of Saudi Arabia or the Shah of Iran or somebody like that does something to us, we turn on the valve.

But the fact is, we are dealing with a world market. That world market is going to continue to supply us. We have to have a way of dealing with the supply and demand economics in that world market, and the possibility of politically induced shortages.

We are very, very worried about the problems of competition. Each time this Congress decides to subsidize one level or another in this industry, invariably the subsidy beats our brains out at the retail level.

The regulations that DOE set in place, and following the congressional legislation, has now made refiners exceptionally well to do, but has not increased the production need.

If you look at the statistics since 1974, you will find that refinery direct-operated retail outlets increased and the volume run through those outlets was the only rapidly growing component of the industry.

I will be delighted to try to answer whatever questions you have, if I can be of any help to you.

Senator GRAVEL. First of all, can you give us actually what the rate of return is on people who own refineries?

Mr. BLUM. The rates of return vary enormously. I think you can look at the stock market figures recently.

The pure refinery companies have just taken off, and we are looking at situations and we know of situations where refineries have gotten in the business with no cash down and pulled out their full investment in less than 8 months. The profitability has been extraordinary.

In fact, they had a protected price for crude oil and have been able to charge what is the world market price for the product.

Senator GRAVEL. We have seen figures here on the rate of return for the majors. I have seen them frequently. I have not focused on specific refinery companies by themselves.

Mr. BLUM. Take a look at some of the refinery companies like Coastal States, Charter, Champlin. These refinery companies have made extraordinary amounts of money. Powerine in California is another example.

Senator GRAVEL. Are they not totally regulated by the Government?

Mr. BLUM. They are, and they are not. We have nonregulatory regulation in which the Government could not possibly enforce a ceiling price if it hired every man, woman and child in America as auditors.

We have a situation where to determine the lawful selling price of gasoline today, you would have to go back to May 15, 1973, figure out what that company was paying for its raw material, what it was charging all of its classes of customers, and then calculate forward whether or not it had a "bank," whether or not it recouped its cost, whether it ran off the bank in an appropriate fashion, and whether or not today it is charging its allowable margin.

We think that the Department of Energy will have to look at over 1 billion transactions to determine whether an Exxon Alert station on South Capitol Street is charging a lawful price for gasoline at this juncture.



The Department of Energy has not been able to get data. They are involved in a 2-year case trying to get records from several small refiners, and the small refiners have frankly told them: "Go to hell."

I submit to you, to have people in this regulatory business is a plain, public hoax.

Senator LONG. If I may interrupt, the starting point is: To have a job over there in the Government, you must not know anything at all about the business that you are supposed to be dealing with.

Mr. BLUM. There are certainly some people highly qualified by that standard.

Senator LONG. If you have any experience whatever in the energy industry, in any part of it, you are automatically disqualified from the point of view of those who feel that it is a conflict of interest if you ever worked for an energy company.

Mr. BLUM. We are faced with things like the Government regulations encouraging daisy chain sales of products to raise prices. The way that works is astonishing.

Cargoes of gasoline and fuel oil change hands on the Gulf Coast at \$1 a gallon. Those prices are 30 cents higher than the retail pump prices in Texas, and you have to say, how is that possible?

It is possible because the Department of Energy allows major companies to buy a product at any price and roll that high-priced product into its overall cost base, so if you are a major company and you are selling millions of gallons of gasoline, if you buy one cargo at a very high price on an average, then it may raise your price only a penny or so.

But what it does is allow people to sell gasoline to them at very, very high prices—in fact, the higher the better.

There have been some instances with major companies coming onto the spot market, in fact, rejecting offers of cargoes because the price was too low. What they wanted to do was raise their overall, wholesale selling price to something approximating the market clearing price.

What is going on here, is that lawful daisy chain transactions are arranged to get the controlled price up to what would be the market clearing price in a normal economy.

I submit that this is an incredible waste of Government resources which has distorted the market beyond comprehension, and we are especially outraged by the problem of no decontrol of motor gasoline at retail, yet the discussion of doing away with controls on crude oil.

Everyone wants somebody to blame. No one wants to break the bad news to the American motorist.

The entire strategy of everyone in this act—there is a cartoon in this morning's Washington Post that is perfect. It has everybody pointing their finger at everybody else.

The entire strategy has been to avoid having Government break the bad news about price and supply to the motorist. There will be no plan for conservation that is mandatory. What Government does is have a system where the retail dealer gets less than he has last year and the consumer is told that he has a ceiling price. It is the retailer's job to break the bad news to the motorist.

When I was in California I talked to the attendant of a station in Sacramento who was on the scene when a motorist in line jumped out of his car and shot another motorist, crippling him for life, as this poor woman who was attending the station was trying to keep order.

I submit it is not the function of retail dealers to keep order in that kind of situation. It is the function of Government to either constrain demand to the point where this kind of thing does not happen, or put the supply on hand, and give us the supply.

In California, the question of environmental tradeoff is very clear. California will not issue permits to build either new refinery capacity or terminaling capacity. There is not capacity to manufacture unleaded gasoline.

With each additional gallon of unleaded gasoline you make, you decrease the overall refinery capacity. In effect as we put more new cars on the road that require unleaded gasoline, refining capacity is decreasing, so we have increasing demand, decreasing capacity, and no ability to expand supply.

In that situation, you are guaranteed to have a crisis.

The only things you can do, then, are either to tell people they cannot drive, go on some kind of a rationing system, or let the price go up to let people, in effect, make their own decisions.

We really need some clear understanding of this situation by Congress. We need some help.

The retailers—we were attacked recently by Barry Bosworth as having been involved in price gouging. They had not bothered to call our organization, or to talk to us.

I have figures on wholesale rent price increases in California posted by small refiners who are nominally regulated at 41 percent in one case.

Since the first of the year, crude oil has gone up to \$18 a barrel—does that make sense? We know it does not. The sooner we get rid of these regulations, the better off we will be. The sooner we get some restoration of a market that has some competition, the better off we will be.

Senator GRAVEL. To your knowledge, in any of the charges or litigation that has been initiated by the Government, has there been any successful prosecution for price gouging anywhere?

Mr. BLUM. What is happening in all of these flying squad attacks on retailers, trying to find out whether there is gouging, after the fact, when the books were examined, in virtually all of the cases, if the retailers were at all sophisticated, the charges were dismissed.

In one case in Chicago, they barged in on a retailer, charged him with gouging 7 cents over ceiling. He was on the evening television. He was featured on page 1 of the Chicago Tribune. When they finished the audit, he was 7 cents under the allowable ceiling.

Senator GRAVEL. Did that make the front page?

Mr. BLUM. No; no one heard about that. It has gone on everywhere. That has gone on in California.

Senator GRAVEL. The impression of the American people is that they are being gouged.

Mr. BLUM. Not under these regulations, they are not being gouged.

The regulations are so designed that you can weave a pattern of transaction to get a market clearing price, no matter how high it is.

The regulations are designed to allow, as they should, a passthrough of costs at each level, so each time you pass through these costs, the price goes up.

What we are frankly dealing with is an American Government that will not allow itself to be blamed for the price increases that are necessary as a result of the policies it instituted.

As I said to a legislator in California, you cannot have your cake and eat it too. You cannot have cheap gas and enough gasoline. You cannot have no policy for dealing with OPEC, let the crude price go to the sky, and not have higher gasoline prices.

The two are intimately related. Until we get all of that together, there is going to be chaos.

Senator GRAVEL. To your knowledge, what is refining capacity today?

How close are we to full capacity?

Mr. BLUM. I cannot give you a flat number for domestic refinery capacity. What makes this worse is we are not talking about a shortage of refinery capacity for heavy fuel oils, or even diesel fuel. The diesel fuel problem, I believe, was caused by simple regulatory foulup.

The constant push-pull and sending it to the wrong place at the wrong time—

The real problem is the capacity for the manufacturing of gasoline, particularly unleaded, and the installation of crackers and reformers. Our problem there is air quality. When you take the lead out of the gasoline to preserve the quality of air, it requires more refining capacity to make the same octane gasoline.

Refinery capacity is expressed in terms of the ability to manufacture octane, sometime referred to in the trade as clear octane pool. You need to do that much more refining to get the same number of octane.

At the same time, we have the fleet mileage standards. Because the Department of Transportation and EPA were not terribly interested in seeing Chrysler go out of business, or American Motors, they allowed those companies to meet the fleet mileage standards by increasing the compression ratios of their engines which, in turn, increased the demand for octane.

In fact, we believe that the fleet mileage standards may have been counterproductive, even though you get more miles per gallon. If you do it by increasing the compression ratio, you actually need more refining capacity, more crude oil, to get the same gallons of gasoline.

EPA has a study on that. That suggests that the fleet mileage standards were counterproductive.

Senator GRAVEL. Who has that study?

Mr. BLUM. EPA.

I have said this, and I will say it again. The fudging on this, the passing of one law, and then fudging the regulations in the hope the problem will go away has all come to an end and we are now right at the end place. We need controls on consumption. We need high prices honestly phased in and dramatic national policies to get a handle on the OPEC situation which, as I said, is not being dealt with at all.

We have no controls at all and no strategy for dealing with those OPEC prices and we could have them.

Senator GRAVEL. Senator Long.

Senator LONG. Let me ask you, those Japanese cars, do they use the same scrubbers that we do?

Mr. BLUM. No; they do not. The catalytic converter was sold to the Congress of the United States as a unique solution to the problem. There are other answers.

They used stratified charge engines that reach the same emissions level without the use of the catalytic converter. That means they do not require the unleaded gasoline and that is a substantial help.

I should remind you that all lead is due to be phased out of U.S. gasoline because of the hazard that lead creates to people who live in the cities which are filled with air pollution.

Senator LONG. Could we use the same kind of motors the Japanese use?

Mr. BLUM. There is no question, Senator, that there are other answers to this. We could use those motors. But let me tell you some of the problems.

Everyone has been predicting that the U.S. demand for gasoline would go down. Instead, it has steadily gone up. The reason—there was a bad miscalculation in the statistics. Everyone thought people would continue to drive automobiles the way they did. Well, as automobiles got smaller, more and more Americans went out and bought pickup trucks and vans.

The ratio of pickup and van sales to automobiles sales has gone something like one pickup truck and van for every five automobiles to one pickup and van for every 2½ in a space of 4 years.

As a result, fleet mileage, instead of going up, has gone down.

DOE's statistics were based on a constant composition of the vehicle fleet. As a result, they were predicting declines in gasoline demand when, in fact, it was going up.

Now, I submit to you it is going to be very hard politically to get controls on pickup trucks and vans that are appropriate. I do not know what the answer to that dilemma is.

Senator LONG. We are using a huge amount of gasoline with those catalytic filters. Some people have disconnected them. We are not supposed to talk about that.

Mr. BLUM. You are absolutely right. The irony is, the GAO study done for the Public Works Committee looked at the problem; 80 percent of the catalytic converters in the United States do not work.

The reason they do not work is because the cars have been detuned because they do not run properly. The reason they do not run properly, the octane levels on the unleaded gasoline are too low. The refineries dropped those octane levels to expand their output.

When you put lower octane unleaded in, the car begins to knock. Everybody goes to the mechanic and says, what do I do? Detune the car. That means change the timing.

If you change the timing, you cripple the converter, not permanently, but you knock it out of action.

GAO says that 80 percent of the converters on the road are not working.

So we have compound chaos. Converters requiring unleaded gasoline shrinking the gasoline supply. At the same time, to make more gasoline, you lower the octane and, in turn, that encourages everyone who owns a car to cripple his converter. It is the most absolute mess.

Senator LONG. A man told me he had the system and had it taken out. He had a mechanic change it over to where it uses ordinary gasoline. It gets 17 miles per gallon compared to 11. He gets 50 percent more mileage by just simply disconnecting it.

Of course, the air-conditioning, that takes another 10 percent. That is what you get with a stick shift. You put in this fluid drive which everybody wants—they do not want to fool around shifting gears—that is another 5 percent or 10 percent of your energy.

That is 70 percent, if you add it all up.

Mr. BLUM. You have a real problem here. The problem is, philosophically, do you try to control what people put in their cars, the shape of the cars, the design of the cars, or do you let the price of gasoline go to a level where they make the decisions themselves?

That is a tough one. Everybody has wanted to do a little bit of both, but not enough of either to make the system work.

And we have had a little bit of both and not enough of either. What we have as a result are lines here, lines in California, and a wild west scene at the gas station. We are not happy with that at all.

Senator LONG. What do you think is a fair price for the operator of a filling station?

Mr. BLUM. It depends on the style of the station. We have been in a situation where we have had declining margins for 5 years. As a result, people have scrambled constantly to be more and more efficient.

We started off, when controls went into place, with average margins of 9 or 10 cents a gallon. At one point last year, we began to come close to losing money. In fact, many of the members did, when margins went as low as 3 cents a gallon.

A fair margin that allows a return on investment, gross margin, no profit, is in the 10-cent range, and there have been very thin allowances in this price control system for inflation increasing wage costs. This is an industry that is very sensitive to increases in the minimum wage. We have had great difficulty with those increasing costs against the ceiling prices mandated by DOE.

Senator LONG. At 10 cents, how much profit would there be for the station operator?

Mr. BLUM. We are talking about a return of equity of under 5 percent, an after-tax return on equity of under 5 percent. This is a very unprofitable business.

Senator LONG. If you are talking about 10 cents, that sounds like he is only making a 1-cent profit.

Mr. BLUM. It may be less than that. It may be in mills. For many of the companies, it is in mills, and sometimes the only way they make money is on related enterprises.

For example, we have one operator in California who is making money on the sales of cigarettes and losing just a little bit on the sale of gasoline, but he kept selling gasoline because it gave him the traffic that bought the cigarettes.

Senator LONG. The companies advertise that they say they are making 3 cents a gallon on a gallon of gas. I just want to know how much a filling station operator makes, in terms of pennies per gallon. How much profit do you think he is making?

Mr. BLUM. It depends. Let me try again on style of operation. If he is a corner station and is traditional, on the order of 4 or 5 cents a gallon, because he sells far fewer gallons, if he is a high-volume, so-called pumper run by an operated independent, probably under a penny a gallon.

Senator LONG. Thank you very much.

Senator GRAVEL. Senator Wallop?

Senator WALLOP. I just have two questions and a couple of observations.

By and large, I very much agree with what was said, except for one thing. When you said that energy independence is a hopeless dream, I think it is only a hopeless dream in a society built on subsidized consumption. I, for one, honestly believe that this country could achieve

energy independence if we could get over the idea that you are entitled to energy at less than the cost of producing it.

Certainly there is no shortage of energy resources in America alone, let alone going outside.

In the area of refinery returns, that was due, was it not, to the entitlements scheme? The refiners who are really profitable are those who have no resource of their own.

Mr. BLUM. We got in a situation where the entitlements programs, we had a small refiner bias in the entitlement system that encouraged the construction of 24 refineries, each of which were 10,000 barrels a day or less, none of which made gasoline.

I sat in the room as an engineer explained to me how to build a refinery.

Senator WALLOP. They cannot really make gasoline.

Mr. BLUM. I had an engineer explain to me how you build a refinery to maximize your cash benefit under Government regulation. The minimum definition of a refinery under DOE regulations is three cuts and we all make those three cuts in heavy fuel oil, diesel and naphtha. Simple, nothing more.

As one guy explained it, putting a candle under a tanker as it floats by.

You get the minimum number of cuts, the minimum run, because that maximizes the ratio of runs to stills that measures the size of the entitlement benefit.

In effect, stupid regulation created refining capacity that was useless.

Senator WALLOP. That goes down to the point where there are fewer and fewer gallons of gasoline in relationship to the consumption, and Senator Long's question on the market, it is pretty hard for me to understand how anybody can deal in terms of a specific number of cents per margin when you have less gasoline than the guys on a 70-percent allocation. If he is going to exist at all, he is going to have to have as much margin on the 70 percent as he did on his 100 percent, because that is where his profitability was.

Mr. BLUM. That has been a substantial part of the problem. We have tried to explain that to Mr. Bosworth. He does not understand it at all.

If you are on a 50-percent allocation and you are making 10 more cents, your costs are constant. It does not help you very much. It is all being chewed up in the costs which are distributed over fewer gallons.

Senator WALLOP. What do you recommend if we were to ease everything right at the moment, get rid of the entangling regulations and the counterproductive choices? What would gasoline sell for in the United States market?

Mr. BLUM. First, let us take it with the present tax structure. My best guess is it would sell for roughly what it is selling for now. I am firmly convinced that all the Department of Energy regulations do is rearrange the kinds of transactions that are undertaken and create distortions.

I am also convinced that if you remove all regulations you are at a market clearing price and you would not see a change in the price of gasoline.

There is something else. I know that this committee has worked on these problems. I appreciate its work, but I will say this. I believe that the oil industry, for too many years, has worked in what is a relatively tax-free environment, that overall the companies have not been taxed on the same basis as other manufacturing companies. Indeed, there is no real reason for the United States to subsidize this industry rather than any other industry. You might as well cut the tax rate on other industries.

The average U.S. tax rate on worldwide earnings for a major company in this industry is very, very low indeed, compared to others. I saw a 1968 figure, four to five majors of under 10 percent.

This is the kind of thing that does not necessarily help us. We ought to do the same thing—the Germans, the French, the British do—which is tax them just the way everyone else is taxed.

I think that would raise the prices somewhat, but raise it appropriately, because it would put appropriate money in the U.S. Treasury and lead to appropriate levels of conservation.

I think that the best way out of this mess is a tax-induced increase in the price of gasoline. If Exxon is taxed perhaps at \$1 a gallon, or appropriate levels of taxation the company would pass it through to the customer.

Senator WALLOP. Thank you.

Senator GRAVEL. Senator Durenberger.

Senator DURENBERGER. Thank you.

I want to say one nice thing about one DOE employee. I have an APSA fellow working for me on loan. He comes out of DOE in San Francisco.

If you watched CBS news this morning, he was caught running out of gas on the freeway someplace, but also, when he was back in Minnesota with me a couple of weeks ago, we met with the leadership of the Minnesota group that you represent. They walked in and recognized him immediately, because he ran the Chicago regional office for about 2 months, and he was the only person in that region in DOE who would ever invite in the dealers to just sit down and talk about their problems.

I would like to ask you to zero in briefly on distribution problems that you have touched on such as price and some of the impact. If you would deal particularly with the impacts of the DOE allocation process on distribution nationwide and what that means particularly for gasoline?

Mr. BLUM. Let me start by explaining how that distribution process works. You attempt through the DOE regulations to give everybody the pro rata share of his supplier's production this month which reflects his position the same month the year before. So that the issue is not equity between regions, nor is it equity between cities, nor does it take into account peculiar demand shifts. It is rather a question of making sure that each retailer gets a pro rata share.

Of course, there are some outlets owned by major companies directly and the company, in effect, decides what it is going to give its own station. It is supposed to do it according to the rules, but it is hopeless to audit that.

What happens, as a practical matter, the people get caught in the cracks. There is one area in California where three stations were bulldozed because of a redevelopment plan. The three stations were

bulldozed, their allocation disappeared in the general numbers of their suppliers. There were three stations left.

They were on 70 percent allocation. In effect, the town had 40 percent of its gasoline.

DOE in region IX would not answer the telephone to talk to people from that town who were out of 60 percent of their supply.

Let me take another example of how this system works in a kind of backward way. You take the diesel fuel situation. There are no statistics whatsoever on supplies on the refiners tanks in the major terminals. The minute fuel goes downstream to jobbers and people retailing that fuel, it disappears from the numbers.

In the farm belt this spring, the farmers got wind of the diesel crisis and started buying the fuel and filled their own tanks on the farm. The jobbers who supply farmers then panicked, because their tanks had been drawn down.

At the point where the jobbers panicked, DOE came in and said, give those jobbers 100 percent allocation of diesel. All that did was restore their inventories.

The minute their inventories were restored, the truck stop people did not get diesel fuel, so now DOE says, all right. Now, we will allocate more to the truck stops so they do not go off the wall. Now, the next group of people comes in and says, wait a minute. Where is ours?

Each time you try to pull—it is like a plumbing system. There is a whole story that goes around about the boys' dorm in college where everybody tried to flush the toilet at the same time and the plumbing burst. It is the same kind of thing.

You try to pull out too much in one area, there is nothing for the other. It is like hydraulics. This system does not work.

This tinkering with allocation here and allocation there, special effect here and special effect there, is not helping the customers and not really relief, under their own regulations, to people who are supposed to get it.

They have promulgated a regulation that says if you have an allocation of under 75 percent you are entitled to relief from DOE. DOE will get another supplier to give you gasoline.

They are so backlogged—there are 7,500 requests for relief—they are so backlogged that they sent a memo to their field offices, do not talk to people who have a 30 percent or better supply, and they are getting to other people on a priority basis.

We figure by the time they get to them, the problem will either have been terminal or be solved some other way.

This is no way to dole out the Nation's gasoline. It is not working terribly well.

Senator DURENBERGER. I am glad you did not come with a prepared statement, because I have learned more from you than I did from a lot of witnesses, and this one may require a little bit of preparation.

I think I heard you talking about the free market operating, and all that sort of thing, but we do have to face the prospect for near term. We spent a lot of time on the floor arguing about what we do in emergency rationing and that sort of thing. If you have thoughts about an allocation system that would work in the short term in certain kinds of emergency conditions?



Mr. BLUM. We have a very simple approach of what to do in an emergency. I have talked about it repeatedly.

You must put restraints on driving and on consumption. Any attempt to take this system and control it from above, which is to distribute scarce gasoline among stations, leads to what I call "Wild West" at the pump, an inequity based on your ability to connive here in Washington to get extra supply.

What you really have to do in an emergency is cut demand, cut it sharply. The best method for that that I can think of is \$1 a gallon excise tax that can be put on in an emergency to cut consumption and then pull that tax, or cut that tax, back when supply and demand come into balance.

I realize it is politically unpopular, but it is infinitely better—and I want to tell you that the people in California would tell you that now—than waiting for hours in line. It is a much more sensible kind of system.

I realize, as I say, the unpopularity, but when people do not want the product because it costs too much supply begins to exceed demand, and the system will sort out where it should go.

If you try to decide arbitrarily, we will allocate so much here and so much there, the Senate turns into a snarling dog fight. Does Minnesota get it, or does Louisiana? Should Louisiana give what it has to California? What do we do?

That is an impossible dilemma. It is much better to put a \$1 a gallon excise tax on it, taper off demand, and then let people buy what they want to buy.

Senator DURENBERGER. My last question deals with the role of pipeline companies. I guess I really do not have much information available to me on what role the pipeline companies play in this. Are they independent, or are they owned by majors? What is their return on investment? Where do they fall in the economic picture? I'm basically interested in the economics.

Mr. BLUM. The two places the pipeline companies turn up are product pipelines and futher problems with product pipelines. Many are common carrier, privately owned common carrier.

The problem is in the crude gathering, this is a dispute in the independent producer and the people who own the gathering lines, the major companies. The fact of control of gathering lines is frequently made, but the price that the major companies will pay the independent producers is somewhat lower than what the price might otherwise be in a free market situation.

I am not really familiar enough with the details of the regulation or nonregulation of those pipelines to comment. I think that is a place you should be looking, and those are the questions you should be asking.

What about these gathering lines? What does it do to the postings that the majors put out in the oil fields, and what is the rate of return on those pipelines.

Senator DURENBERGER. Thank you.

Senator GRAVEL. Senator Boren? —

Senator BOREN. You talked about the loss of refining capacity that comes about as we reduce the lead content. What percentage of reduction have we already experienced?

Mr. BLUM. About 5 to 6 percent reduction in refining capacity. We are talking about refining capacity already straining to meet the U.S. demand.

Senator BOREN. In fact, if we have a shortage today of 10 to 15 percent, 5 or 6 percentage points of the 15, about half of the shortage be attributed to just that change alone?

Mr. BLUM. Most of our shortages in the critical area of gasoline is directly related to the gasoline capacity of those refineries.

Senator BOREN. As we move on and we go ahead and implement the anticipated rule change so move completely away from leaded gasoline, how much more of our capacity would we lose?

Mr. BLUM. In the 3-, 4- or 5-percent range.

Senator BLUM. Would that mean a total loss of somewhere around 11 or 12 percent?

Mr. BLUM. Eleven or twelve percent.

Senator BOREN. In California, you talked about the refinery shortage there, as it applies to gasoline, and also to terminal facilities. I have seen some estimates that we are losing as high as a half a million barrels of oil a day.

Mr. BLUM. There are a variety of estimates.

Senator BOREN. Is it not true that a number of companies have made applications for permits?

Mr. BLUM. Yes, all kinds of applications. The California Air Resources Board is absolute murder on them. There is one story of a fellow who is trying to build a terminal in Sacramento. He took one of these environmental tradeoffs. He raced around and found a dry-cleaning establishment in the city of San Francisco that was ready to allow him to turn around their plant completely so there would be no emissions.

He got the deal, only to find himself in the town where he is building the terminal with everybody from the Grey Panthers to the local environmental groups screaming that it was no good. He had hydrocarbons out of the air in San Francisco. We are on the other side of the bay. What are you going to do in our town?

The guy is just throwing his hands up in despair. He needs 30-odd permits and he has been working on this terminal project for 5 years.

I cannot argue—I want to stress this—I cannot argue that the environmental concerns are not serious. They are very serious. If you were in Los Angeles last week, you would have been choking. The problem is to find a way to do this and to get to it, and I realize whatever the answer is, it is going to be unpopular. The time has really come to bite the bullet.

Senator BOREN. I realize that we have a mobile population. While we need catalytic converters or other restrictions in some areas such as Los Angeles, it may not be so necessary in other areas. It may be the exception where it is necessary.

Would it be at all practical to implement these requirements only in certain areas?

Mr. BLUM. It could, but you have a problem. What happens when a car moves from area A to area B? What about when people sell their cars? Do you have cars that can only be used in rural Oklahoma as opposed to urban New York?

You get into a variety of problems which really are not acceptable. I think you would find the manufacturer saying, "Look, it is harder for us to design all these different specs than to come up with one national answer."

Senator BOREN. Could you not do a vehicle inspection on catalytic converters?

Mr. BLUM. Let me tell you what the record has been. Congress has been very unwilling to impose any burdens on people for having violated either the laws regarding the catalytic converter or, for that matter, misfueling of the car. At the moment if you put leaded gasoline in an unleaded-only car, you are not subject to any penalty, but the guy who owns the station can be fined \$10,000.

If you go and ask a mechanic to take your catalytic converter out, you cannot be fined, but the guy who took it out could be fined \$10,000.

On the question of State inspection, that kind of program is really necessary to make catalytic converters work. After all, they are not essential to the function of the car and most people would never get them fixed. No one has been willing to force people to go get them fixed, because they know that might cost \$100 to \$180 a car and there would be some very unhappy people if they had to spend that to fix something they do not use.

Senator WALLOP. We tried something similar to that. EPA tried it with the high-altitude system for cars up in our country. Primarily, the cars were designed to take care of the problems that existed in Denver, because they were having problems. But it meant about \$150 to \$160 a car more in Wyoming, and you could buy a car in Montana for less because it was not above 5,000 feet in Billings. All our dealers were going busted. People would go to Billings, making their deals out of State, and come back with the cars.

I think our overall problem is bigger. As you say, we are going to have to deal with it more by standards.

Senator BOREN. Eighty percent of the devices are not working anyway, and causing an increase in consumption.

Mr. BLUM. Senator, so you can put this in some context, EPA estimates we have a \$7 billion national investment in catalytic converters. The public dilemma is the burden that puts on us.

If you abandon the existing cars that are on the road and say, too bad about them, we are not going to worry whether they work or do not work, we are talking about a major foulup in terms of intergovernmental agency cooperation that has to be dealt with.

There is a need for coordination. You cannot talk about the fuel supply, the automobile, and the environment separately. They are all part and parcel of the same thing.

Senator BOREN. I agree.

Could you walk us through what you refer to as the "daisy chain" and tell us how it works? Could you start us off with a barrel of crude oil and walk us through the process of where the price is controlled at each level, and where it is not?

Mr. BLUM. What I was talking about was the movement of the gasoline from the refinery down to the market and you have controls, obviously, on the crude oil level and those controls tend to level out the price, but all refiners pay the same amount.

But it does, as you all know, create this entitlement pool that the Department of Energy regards as a discretionary fund to help those who are blessed, and the discretionary fund has been given out rather freely.

Once it is through the refinery, this is where the problem begins.

Senator BOREN. Let's take a gallon of product.

Mr. BLUM. You will get a refiner who has a supply denominated under the system as surplus. That is to say, his customers have not, under the allocations system, demanded their monthly quotas or supply, for example, that he was entitled to use at his own station but he has decided to close his station.

He sells that to a broker or middleman of some kind. The broker then adds his markup and sells it to another broker. That broker has a markup and sells it to another one.

Ultimately, the price of this product—because each one has an allowable ceiling, each of the middleman transactions are perfectly legal. Ultimately, the price begins to reflect something like the market price.

At that point, the product changes hands.

Now, the reason the price gets so high, and the market price is so high, is this rolled-in pricing that is part and parcel of the major companies' pricing schemes.

Senator BOREN. Go through that again.

Mr. BLUM. At one point, we had a situation—this is all in the public record at DOE—Standard Oil of California had an artificially low national wholesale price for gasoline. They had a real problem as a company. This was because of the ceiling.

They were obeying it. They were selling it wholesale at 45 cents when everybody was at 50.

Senator BOREN. They have some surplus?

Mr. BLUM. This is the buyer; they have a problem. Everybody who is an assigned supplier to Standard of California wants to buy every drop of gasoline they had, will have, had in storage. There is a run on their product. They are just stripped down.

Now the company starts searching around—where can we buy some very expensive gasoline? We would like to have it as expensive as possible, because if we get gasoline for a buck a gallon and we get two shiploads of it, we might get our average wholesale price up to 50 cents, and if it gets to 50 cents, their run on our product stops.

Enter now the middleman and the entrepreneurs who figure a way to take other people's 50-cent gasoline and then, through a series of transactions, you get the price up to a buck. It goes into that kitty, and back out again, and the average price for Standard of California now goes up to a reasonable level.

I submit that what this has done is create the most distorted kind of transactions, creates classes of middlemen and merchants who really have no place in the trading of product. Needless to say, regulation of it is almost impossible.

There is yet to be a prosecution of new-oil-old-oil cases. I do not think there will ever be prosecution.

Senator BOREN. You say just take price control off?

Mr. BLUM. I think the price control is pernicious and getting us absolutely nowhere.

You can have a legal selling price, as they did in California last week, of \$1.30 a gallon. It is a public fraud to say that price is controlled. The price 3 months ago, 6 months ago, was in the 50-cent, 60-cent range and I think that everybody is kidding everybody else.

It is a matter of trying to tell the American people they can have their cake and eat it too, and then turn around when the price goes up that high, saying you guys did it. You are gouging.

That is nonsense. They have to take the responsibility, too.

Senator LONG. How could they possibly get up to \$1.30?

Mr. BLUM. It is perfectly legal. Gasoline was loaded in the cargo in Texas, on board ship, at \$1 a gallon. After going through the hands of several middlemen, add on transportation from the gulf coast through the Panama Canal, terminal costs, shipping to the station and the allowable margin for the retailer, and there you are at \$1.30.

Senator LONG. All in compliance with DOE regulations?

Mr. BLUM. To the letter, absolutely.

DOE sent auditors out when the \$1.30 price was published nationally. They sent auditors out and said, oh, my God. How did that happen?

The auditors came back and said it was legal.

Senator BOREN. The wholesaler?

Mr. BLUM. Roll it in. Adding numbers of wholesalers. There are many different ways to do it. There are so many complexities in these DOE rules. It is a question of how ingenious your lawyer is and how he works. It is not difficult.

Senator BOREN. In regard to the people selling back to the wholesaler, do they obtain their product from a refiner who had some surplus capacity?

Mr. BLUM. Who had some surplus product?

Senator BOREN. Do you have any idea how much surplus product there is?

Mr. BLUM. Not really. The numbers have changed somewhat. Before they updated the base period, virtually half in the United States were sold as surplus product. Now it is a smaller fraction, 15 percent.

Senator BOREN. Thank you.

Senator GRAVEL. Senator Dole?

Senator DOLE. I missed the first part of your testimony. Could you summarize your suggestions?

Mr. BLUM. All the solutions are terribly unhappy, in my judgment. It is a question of constraining consumption one of two ways: Of telling people they cannot drive, or alternatively to taxing gasoline so that consumption goes down and letting the price act as a factor, which gets people not to drive.

The thing that I am saying will not work is the have your cake and eat it too approach. We are going to give you price-controlled gasoline at 60 cents and give you enough of it. The result is, there is not enough of it, instead of having any way of allocating it, we get the Wild West at the gas station.

I think mandatory conservation or an increase in price are the only two answers short run; longer run, getting rid of this regulatory mess which discourages refinery expansion and refinery construction and paying some attention to OPEC. Two critical pieces.

Senator DOLE. Of course, you understand that the Congress is split on the issues. Some Members are for product. Others are willing to go for higher price and some product.

Mr. BLUM. No question. It is a very unhappy time. A State legislator I talked to in Sacramento when I started laying out the alternatives said, is there not some way that we can have our cake and eat it too? He was desperate.

Here he is, looking at the environmental problems for his district in Los Angeles, which are very, very unhappy—very high smog levels and great trouble and the bill before him is a bill relaxing some of the pollution controls and he wants more gasoline and the pollution controls. How do you get it?

You cannot have everything. It does not work that way. Some of these things are mutually incompatible.

Senator DOLE. There are some who recognize it may be good politics to advocate total controls, low prices, and lots of product. It can never happen, but I assume those who take that position must believe that the average American consumer will not recognize the issue.

Mr. BLUM. I think that the demonstration we have had recently leads people to understand that there is an incredible mess and something has to be done to straighten it out.

Senator DOLE. Would it be fair to assume that you have less than complete confidence in DOE?

Mr. BLUM. Absolutely.

Senator DOLE. Should Congress make some drastic changes in the Department of Energy?

Mr. BLUM. I have some serious questions about what its function is and what it is doing. I personally believe that we are not appreciably better off with that agency and its function.

When I really paid attention to this crisis in 1974, we had a series of proposed solutions that were sent up to Congress and the same solutions are coming up. Now there are some 17,000 people working on it and we are spending what, \$6 billion a year trying—I am talking only about the regulatory side, not the nuclear or the weapons side.

We are spending all that money just coming up with other answers and they are coming up with the same old stuff. I think we could have done better.

DOE has also gotten into the pet project business. You have everybody who is advocating particular solutions to the crisis—

Senator DOLE. Gasohol.

Mr. BLUM. Everyone has his own answer. Each one wants their own subsidy for that answer, but each subsidy for each answer defeats another subsidy for another answer.

For example, if we get coal liquefaction that creates gasoline, gasohol subsidies will have to match the coal liquefaction subsidies for gasohol to be economic. What we get are 27 different processes, each of which are competing, not on their merits, but on the basis of how much subsidy they got.

Was the Senator from Kansas more effective for his request for gasohol subsidy than the Senator from Wyoming for coal subsidy?

Senator DOLE. Are any of your dealers involved in the sale of gasohol?

Mr. BLUM. Some have tried it.

Senator DOLE. It is difficult to sell the product?

Mr. BLUM. No, not at all.

Senator DOLE. I saw a story in Saturday's New York Times about investment in gasohol in Brazil. Did you see this?

Mr. BLUM. I will say, Senator, that I noted with some irony that the very Congressmen who have stickers all over their offices from Iowa calling for gasohol production, gasohol is the fuel of the future, that the charge on the floor of the House for 100-percent allocation of diesel fuel so the farmers could plant their corn.

I have the distinct feeling we were watching the diesel fuel go in one end to come out as gasohol at the other end. There is a very serious question here as to whether it is not sort of a perfect circle. All we are doing is taking one kind of petroleum and ultimately converting it into another fuel.

Senator DOLE. Do you think the Congress has to be consistent?

Mr. BLUM. I would be the last person in the city to insist that the Senate be consistent.

Senator DOLE. If refineries with less than 175,000 barrels a day did not receive the so-called small refinery bias, do you think they could compete with the larger refiners?

Mr. BLUM. I think they would have very serious difficulties competing. The problem then goes back to access to crude oil. The problem is, can they get their hands on crude oil at the same price as the majors get? The answer to that is no.

Not only that, we believe that the foreign tax credit arrangements have subsidized major acquisition of crude oil of the major independents. For example, an independent refinery in Texas that buys crude oil directly from the state trading company in Nigeria is paying that price. That is cost of goods sold, and so be it.

On the other hand, a sophisticated major that sells to a trading company or production company and is buying the same oil from Nigeria, Libya or wherever, he is getting a foreign tax credit against which he can write off certain other profits.

This small refiner is left out by the subsidy that he does not get, and his inability to bargain.

A 30,000-barrel-a-day refiner cannot get on the plane and start dealing with those Middle East governments on the same terms. What is going to happen, when you eliminate the entitlements program, something is going to have to be done to protect the competitive viability of those small refiners.

I urge that whatever it is, that attention be paid to getting them the crude oil at something like a comparable price and a fair price in tax terms.

If you can do that, the problem will be solved. If not, you are going to have them all in here asking for a subsidy.

Senator DOLE. The same thing is true with domestic refiners versus foreign refiners. Perhaps we are going to have to provide some protection because foreign costs are cheaper.

Mr. BLUM. Again, the foreign tax credit is a substantial problem in the area of the foreign refiner. If you have a refinery in the Bahamas, in Aruba, that refiner is going to be operating in a substantially tax-free environment, because the tax credits have piled up elsewhere. You cannot expect a taxed refinery in the United States to compete with a tax-free refinery offshore.

I submit that that is an issue you should look at very carefully as you decide how to go about it. I would much rather see you even add the tax burdens than to try to go into subsidizing the small refiner in addition to subsidizing the big one. I would rather abolish the tax subsidy the big one gets and let the price begin to reflect a fully taxed industry.

The reason gasoline is so cheap here is not because the raw material inputs are lower, or the companies are taking any less than in Europe. It does finally reflect the fact that this industry still is not working in a fully taxed environment.

I think the taxes should go up, and the price of gasoline should go up with it.

Senator DOLE. Thank you.

Senator GRAVEL. Thank you, Mr. Blum.

Mr. BLUM. Thank you very much.

Senator GRAVEL. We appreciate your testimony.

Our next witness is Harold B. Scoggins, general counsel, Independent Petroleum Association of America.

**STATEMENT OF HAROLD B. SCOGGINS, GENERAL COUNSEL,  
INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA**

Mr. SCOGGINS. Thank you, Mr. Chairman. I will summarize my statement and ask that the full statement be filed in the record.

I would like to note, also, that there are some 29 unaffiliated State and regional associations of independent producers joining us in presenting this statement today, and our combined membership represents virtually all the independent producers in the United States.

Just so there will be no mistake about who we are, let me make it clear. We are the independent oil and gas producers. We do not operate any service stations. We do not sell gasoline. We do not have any refineries. We do not have any pipelines. We do not have any tankers.

We operate in the United States drilling wells and producing oil and gas. We have had our prices controlled at the wellhead for several years. We are not given any entitlements as refiners are. We are not permitted to pass through our increased costs of operation as other segments of the industry are.

We live in an environment where the price of our product is totally controlled by Government regulations but none of our costs of operation have been controlled.

I would like to discuss, just briefly, the so-called windfall profits tax which, as you gentlemen well know, is not in any way related to profits, and also speak generally to some of the persisting charges that have been made against domestic oil producers to the effect that they are profiting inordinately from the Nation's energy problems.

I think the facts will clearly demonstrate that this is not the case.

History has demonstrated conclusively that increased wellhead prices of crude oil and natural gas have always resulted in an increase in exploration, drilling and development and more production of oil and gas. Since World War II, every 10-cent change in the composite per barrel price of crude oil and natural gas has resulted in approximately \$120 million change, either up or down, corresponding to the increase or decrease in crude and natural gas prices in the amount expended for exploration and development.



In the past 2 years, however, the expenditure rate has increased significantly and is much greater in ratio to the prices than it has been historically.

I think that this would very well demonstrate what most economists would postulate. When you have the material in short supply, producers are going to strain their economic and financial resources to increase the supply of that material.

Let's look briefly at what we have as a result of the increased activity resulting from our higher prices.

In the 5 years since 1973, we have drilled and completed approximately 100,000 new oil wells in the United States. If we had continued drilling at the same level that we were drilling in 1973, we would have completed only approximately 60,000 new wells.

By drilling and completing these additional wells, we have brought on additional daily production of almost a million barrels per day by 1979 over what we would be producing otherwise.

In other words, we are able to import approximately 1 million barrels per day less now than otherwise would be the case, because of the increased level of drilling since 1973. That very significantly, we think, demonstrates the fallacy of the argument that all of the higher prices have not resulted in any increased activity and have not resulted in any additional crude oil supply. They have, in fact, resulted in significant new activity and new supply.

What are the possibilities for further improving our supply in the future? Under phased decontrol of crude oil, which we have been advocating for some time, the increased revenues to producers, recycled in exploration and drilling that has occurred in the past would improve our productivity. Based on the consistent relationship between reinvestment success ratios for drilling of new wells and productivity per new well, we estimate that an additional 400,000 barrels per day of crude oil production could be brought onstream by 1981 and approximately 2 million barrels a day by 1985.

It also has been estimated by the Chase Bank, and several others, that the increased price of crude oil would bring about conservation of approximately 1 to 1.2 million barrels per day by 1985. By that time, the combined impact of the additional daily production of domestic crude oil and the reduced consumption would mean that we could be importing 3 million barrels per day less than would otherwise be the case.

All of this assumes of course, that you do not have the so-called windfall profits tax or the excise tax imposed on domestic producers.

Congress is overdue to give market pricing of crude oil a chance. If the rewards do not outweigh the costs, you can always reimpose controls at any time in the future.

I would like to put into perspective some of the current and unfortunate misconceptions about the domestic petroleum industry. First, that oil prices have been a major factor in the current inflation rate. Second, that oil companies are realizing profits that are above normal and out of line.

On the first point, President Carter's economic report to the Congress reveals some rather interesting comparisons. While petroleum prices have been subjected to political criticism for their presumed inflationary impact, the President's report put them in focus in relation to other major costs experienced by the consuming public. I would refer you to this chart which appears in our testimony on page 6.

This illustrates data taken directly from the President's economic report to Congress. It shows, compared with 1973, the total 1978 consumer outlays for gasoline and oil were up by \$23 billion. But, in that same period of time, furniture and household equipment was up about \$27 billion; clothing and shoes were up over \$37 billion; housing costs were up almost \$84 billion; food costs increased over \$100 billion.

The increased cost of gasoline and fuel was less than a third of the increase in the cost of housing and only one-fourth of the increase in food costs—but it is oil producers who are singled out for political vilification and for taxes on imaginary windfall profits.

It is clear from the President's own figures that if windfall profit taxes were applied to compensate for cost impacts on the economy, petroleum would not be first, but far down in line for such treatment.

Now, I would like to briefly present some facts which tend to put "profits" of oil companies in perspective. The chart, "Rates of Return: Oil Companies versus All Manufacturers" shows that for 23 years ending in 1977, rates of return on oil investments have been below the average of more than 500,000 manufacturing companies reporting to the Securities and Exchange Commission.

There has been a great deal of concern expressed over first quarter 1979 profits of oil companies, individually and collectively. The May 7, 1979, issue of U.S. News and World Report contains some figures on comparative first quarter profits among various industries. Average petroleum profits were reported to be up 57 percent, which sounds impressive. But the profits of paper companies were up 100 percent, railroad profits were up 190 percent, nonferrous metals up 350 percent, and the profits of steel companies up 4,282 percent.

The only thing this illustrates, is that quarterly change in profits is really a meaningless measure for determining the economic health of any industry.

Senator DOLE. Everybody uses oil products. That is why it is easy to focus on that.

Mr. SCOGGINS. That is correct. It is something you are confronted with every week, or every few days when you go to the gasoline station. But certainly it has not contributed to our inflationary economy nearly to the extent that some other things have.

Let's look at total return on investment, which is a much more meaningful measure of the economic health of a particular industry and gives a better indication as to what kind of profit a company or an industry is making.

In the May 7 issue of Fortune magazine, there was a compilation of return on investment, return on capital, return to investors, of all of the major industries, particularly the Fortune 500. They were grouped by industries. Not one oil company appeared in the top 10 companies among the Fortune 500 for total return to investors.

Broadcasters and motion picture producers topped this with a return of 33 percent; aerospace was next with 28 percent. I might add that Boeing led the list in the aerospace industry and you certainly have not heard the Senator from Washington make any comment about their obscene profits.

There were some 16 other industries that reported better total investment returns in 1978 than of mining and crude oil production, 1.67 percent.

This is not oil industry propaganda. This is data compiled by Fortune magazine from public documents from the Securities and Exchange Commission and financial reports that are published routinely.

Many independent producers actually suffered a decline in their return for the first quarter in 1979, compared to 1978, but for the most part, they are not public companies. You do not hear anything about their return.

The public is totally unaware of this.

We submit that the facts show conclusively that there has been considerable demagoguery by those who have singled out oil company profits for condemnation.

Legislative actions based upon these misconceptions have greater negative impact on independent producers than for the industry overall. While the major integrated companies derive revenues and profits from diverse operations around the world, the independent producer derives all of his revenue and profit in one country, the United States of America, and from one activity, the wellhead sale of crude oil and natural gas.

Because the capital of independents is derived principally from wellhead sales, it is clear that prices that they receive for their product must be adequate to provide both the incentive for investment in future operations in exploration and drilling, but also must supply the cash flow.

The independent must have, out of his current sales, the cash necessary to cover his continually escalating costs to maintain production of his present wells to pay his increasingly heavy tax burden, both State and Federal, as well as to local governments; to cover the cost of the dry holes and the wells which are completed as producing wells, but which never pay out on a successful financial basis, and then to provide the additional revenue necessary for future exploration and drilling.

Throughout the period 1957 to 1971, the cost of drilling and production increased steadily, but the price of crude oil actually declined throughout much of this period. In fact, it did not regain its 1957 price level until 1974.

The independent was caught in a severe cost-price squeeze, forcing reduced spending for exploration. During this time, domestic drilling plunged from a 1956 high of over 58,000 wells to a low in 1971 of just over 20,000 wells. Some 10,000 independent producers literally were forced out of business by the economic conditions that existed.

But when crude oil prices rebounded in the early 1970's domestic exploration and development rebounded sharply and domestic drilling began a dramatic turnaround.

An analysis of the Bureau of Census Annual Survey of Oil and Gas reveals that in the period 1973 through 1977, independent producers—and that is all U.S. domestic producers excluding the top 24 major companies—reinvested over 100 percent of their gross wellhead revenues back into exploration, development, and production.

I would like to repeat that—that is over 100 percent of gross wellhead revenue. That is not after tax. That is before anything has been deducted.

Senator Long. Would you say that again? I am not sure I got it straight.

Who does this reinvestment? All oil companies, or independents?

Mr. SCOGGINS. The independents. If you take the Bureau of Census annual survey, which covers the entire industry, you eliminate the top 24 companies, which is basically the major international integrated oil companies, and look at the data for all the other companies in the period 1973 through 1977. Independents received approximately \$33.3 billion gross wellhead value for their product.

They spent \$34.9 billion. Over 100 percent has actually been put back into the industry.

Senator LONG. During that period, the independents put more back in than they made.

Mr. SCOGGINS. That is correct. This is verification of what we have long contended, that the independent sector does put more money into the industry than it ever takes out. That is because independents, historically, will go out and do some wildcatting. They will make a successful discovery. They will drill a few development wells to try to prove up their reserves. Then they borrow some money to do some additional drilling and a good bit of that additional money they borrow never gets paid back by the successful wells. It goes into more dry holes.

Contrary to what most people think many developmental wells turn out to be dry holes.

We have a chart depicting this ratio of investment to expenditures that we will submit for the record.

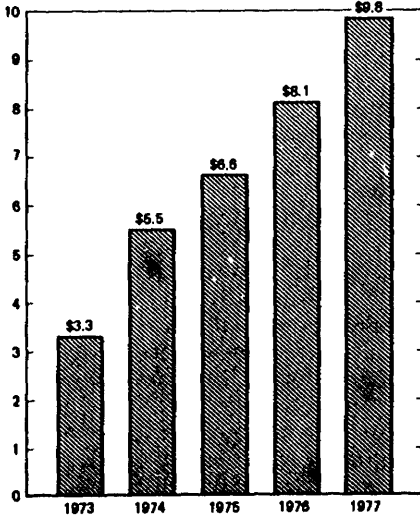
[The chart referred to follows:]

### INDEPENDENT OIL & GAS PRODUCERS

(ALL U.S. PRODUCERS EXCEPT THE 24 LARGEST COMPANIES)  
1973 - 1977

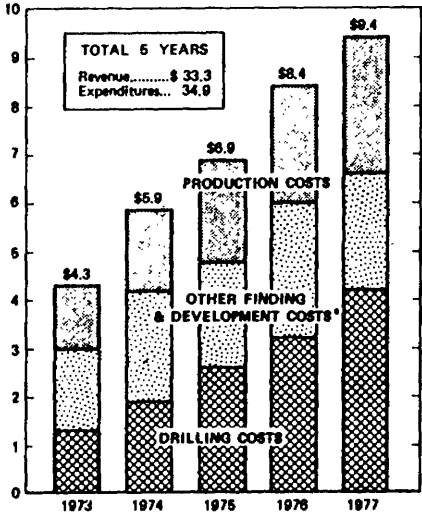
WELLHEAD VALUE OF PRODUCTION

(Billion Dollars)



FINDING, DEVELOPING & PRODUCTION COSTS

(Billion Dollars)



\*Includes geological and geographical, lease and land acquisition, test hole expenditures, etc.  
Source: U.S. Bureau of the Census, "Annual Survey of Oil and Gas".

IPAA CHART  
May 1979

Mr. SCOGGINS. There has been considerable discussion about the possibility of establishing some sort of a plowback mechanism to be sure that the proceeds of this excise tax or the proceeds of the decontrol are put back into the ground. The evidence we just submitted, we think, demonstrates the fact that there is no need for any such plowback requirement. In fact, independents have always put back in the ground all of their gross revenues.

But another reason why we are very much opposed to a plowback requirement is based on our experience with Congress in the past. Any plowback provision which is a result of legislative compromise has never been one which was capable of being implemented by the independents. The typical independent has to have the cash in hand in order to make the investments that would be required to qualify for plowback credit.

The way the tax is proposed to be structured, the way it was proposed in the past, the dollars come off the top from the sale price of the oil and the purchaser keeps the money and remits it to the Government. The producer never gets the dollars in hand, yet he is required to find the dollars to make expenditures to qualify for a credit against that tax, so he is always like a dog chasing his tail; he simply cannot get there.

He is never going to be able to make enough qualified expenditures under the different plans that we have seen designed in the past in order to earn the credit. He will be in what amounts to a liquidating posture. Each year he will be unable to earn less of the credit, so he has to pay more of the tax. In each subsequent year, he has fewer dollars to invest in exploration and drilling, and this just liquidates him out of business.

That is part of what has gotten us into the problem we are in today, why we do not produce more than we do domestically, because the independents have been forced into a liquidating position.

Unquestionably, independent producers as a group would be impacted much more severely by this proposed excise tax than would major integrated companies because of the way it is structured. For example, independent producers own most of the stripper oil, the price of which, in effect, would be rolled back by this tax, and would be controlled permanently.

Subjecting stripper oil to the wellhead tax would reduce the economic margin for every well in this category, some 369,000 wells at the present time.

Approximately 65 percent of all wells in the United States are in this category of stripper wells, but they only account for 13 percent of total production. Rolling the price back would advance the abandonment date of each of these wells and force consumers to export dollars to replace at world prices each barrel that is lost from domestic production.

I would like to call the committee's attention to some facts which may help explain why gasoline consumption has literally been going through the roof lately. You heard a good bit of discussion about that from Mr. Blum, and he alluded somewhat to the principal fact, but not specifically.

In our testimony, there is a chart which demonstrates the relative purchasing power of the average American wage earners, average hourly pay, each 10 years from 1928 to 1978. This chart demonstrates

that in 1928, the typical worker's hourly wage would allow him to purchase 2.7 gallons of gasoline. In 1978, he can purchase 9.3 gallons of gasoline with that same hour's wage.

It has been a constant trend throughout the years that wages have gone up much faster than the cost of gasoline.

So long as that continues to be the case, people are going to continue using gasoline at the extremely high levels that we have been using it recently.

We need to inhibit demand. We also need to find some means of alleviating the difficulties caused by the result of the rising energy costs, but this is not going to be addressed by penalizing petroleum producers and impeding future supply.

On the other hand, a tax at the gasoline pump would inhibit demand, not production. The gasoline tax would not be discriminatory. It would apply to the product of all crude oil, foreign and domestic. The gasoline tax could be applied selectively to inhibit private sector pleasure driving or boating, for example, and farm vehicles and essential public transportation could even be exempted or have the tax rebated.

The tax on crude oil, on the other hand, will be passed on to all consumers, including fuels for home heating, essential farm production, public transportation, and all other essential uses.

There are no redeeming features to the proposed wellhead tax on domestic crude oil. It penalizes only domestic producers, inhibits only domestic production. It will pass through with no selectivity to all consumers.

We would strongly urge the committee to consider the fact that the windfall tax, on domestic crude oil production where there are no windfalls, would be the most misplaced, counterproductive and regrettable tax in history.

Thank you, Mr. Chairman.

I would be happy to answer any questions.

Senator GRAVEL. Senator Boren?

Senator BOREN. I want to commend Mr. Scoggins for his statement. I think it puts into perspective very well the relative profit positions of various kinds of operations in this country. I get very impatient when I read the reports focusing on the percentage of increases in profits when they do not go back and talk about what the levels of profits are in the first place, and how they compare with various segments of the economy.

I have maintained that one of the things that we are getting ready to do is to set the stage, because of the rhetoric which has been used, to have the greatest ripoff of the consumer of all. That is a ripoff by the Government.

We are getting ready to put the consumer in the situation of paying a higher price and getting no more energy in return, because we are setting the stage for the Government to take away the proceeds from the higher price that the consumers pay.

It seems to me that there are two justifications for decontrol: The first is to get the price to a level that it will increase and encourage conservation and also encourage the development of alternate fuels. The other is to generate sufficient capital so we can have more production in this country.

If we take away the capital that has been formed through a tax, the consumer will find himself or herself paying more, and not getting any additional supply in return.

I wonder if you have calculated with the additional prices which will be coming from decontrol, the part of the additional price per barrel produced without any additional or special taxes which will go into the local governments with the gross production tax or through regular income tax channels?

Is there not a high percentage of each marginal dollar already going in taxes?

Mr. SCOGGINS. This is correct.

This impact is much more severe on the independent than on the industry overall. Most of the examples that have been put out by the White House or Treasury Department or some of the committee staffs in Congress, and certainly all the publicity has dealt with the impact on the typical large, integrated corporation.

Most independents are not incorporated. They operate as a sole proprietorship or some sort of partnership.

Without any windfall tax at all out of each additional dollar of revenue, the independents would keep approximately 21.5 cents.

Senator BOREN. That is what the independent would keep?

Mr. SCOGGINS. That is correct, without the windfall taxes.

Senator BOREN. So we have 79 cents already going in tax and/or other charges, somewhere along the line?

Mr. SCOGGINS. This obviously will vary in what State it is operating in, what the State severance tax is, all these other variables. That is based on a typical situation for a producer in the State of Louisiana, where you have one-eighth State severance tax. They have a lower income tax than some of the States do, but all these things tend to balance out.

Senator BOREN. If we are sincere about helping the consumer to get more energy produced, should we not try very hard to find some mechanism to have that capital returned to the hands of the independent producer to do the job? These producers have a history of reinvesting the greatest amount back into further exploration and production.

Mr. SCOGGINS. We certainly would agree with that. We think there is in place now a very effective tax mechanism so that the producer is either going to put the money back into the ground in exploration and production, or pay it to the Government in the form of income tax, one place or the other.

Senator BOREN. Let me ask you this question. I realize that this is hypothetical and that you oppose the imposition of any kind of excise tax—I call it an excise tax, not a profits tax—because it is not related to profitability.

Suppose that your advice is not followed and an excise tax were enacted. While you have expressed your reservations about the way plowbacks have been fashioned in the past, wouldn't you favor some kind of plowback?

If a tax is imposed and you were looking for some way of getting capital into the hands of the independents, what would be the most important element of any credit that might be given, or any plowback that might be given? Would it be that the cash flow belongs to the producer and the producer would be allowed to have a sufficiently long period of time to find productive reinvestments?

What would be the elements of a plowback which could work if you had to have one? I realize historically it has not worked because the Congress has not written the right kind of provision.

Mr. SCOGGINS. You put your finger on two of the principal problems. One is the cash-in-hand situation. The producer cannot have that money go to the Government before it ever comes to him and have him try and earn some credit against it, because without those dollars in hand, he cannot make the expenditures.

Exploration and development is a highly risky business. You cannot borrow money for wildcat drilling. You sometimes can borrow money to do some of your developmental drilling after you have found a new reservoir or a new reserve of oil and gas. Without the dollars in hand to start, you cannot do the wildcatting.

Another problem has been the nature of the qualified investment. In the past, there have been so many restrictions put on what kind of investment would be considered a qualified investment that most of the high-cost items that the typical independent is going to pay for would either not qualify at all or only part of his expenditure would qualify.

Lease acquisition is a good example. Nothing expended for acquiring a lease was allowed as a qualified expenditure on the theory that to allow it as a qualified expenditure would have people go out and bid any price to get a lease somewhere.

In the past when there has been no requirement for a plowback and the producer has been free to pay whatever the market would bear, you have not had this situation, so I do not know why, under a plowback, that you would have the situation.

Also in the past, they have not allowed qualified expenditures for the purchase of used equipment, for the most part. The typical independent in times of shortage of material has relied on finding used equipment, used drilling rigs or salvaging two rigs to make one good rig, used pipes, used pumps, what have you. That is the way the independent survives.

If he does not get any credit for the purchase of this material, he simply is going to be in a liquidating situation. He will never be able to earn that credit.

Senator BOREN. Thank you very much.

Again, I want to commend you. I hope that your testimony will alert the members of the committee and the American people to the point again that when you have a sector like the independent sector in the petroleum industry which is putting back more into production than it is actually earning, we should allow the independents to put the money into producing more energy. This will give the consumer back much more for the sacrifice of paying higher prices than taxing the proceeds away and putting them into some sort of governmental program where there is a tremendous waste and not much more production as a result.

I commend you for your statement.

Thank you, Mr. Chairman.

Senator GRAVEL. Senator Wallop?

Senator WALLOP. Thank you, Mr. Chairman.

I have two questions that I would like to ask and then, if I could, I would like to submit some more later on, because the hour is late.



I found your testimony interesting, to say the least, and looking at it from the public perception of what goes on. In your testimony you presented evidence, certainly the fact that oil industry profits have not experienced any greater increase than profits of other industries. In fact, if you look at the charts, it is considerably less.

Even so, there is still a substantial question in the public mind about the degree to which the industry is reinvesting the proceeds.

What evidence is there that would indicate the degree to which producers are not simply pocketing the proceeds of increased crude oil prices because presumably there would be a more substantial increase. We would hope there has been a more substantial increase than there has been in the past.

Admittedly, under the profit and capital structure that exists now, it has been more than 100 percent, as you pointed out. Is there evidence to indicate that with substantially increased income there would be an increase?

Mr. SCOGGINS. Yes, Senator.

First, you have most directly the history of the industry, particularly the domestic segment of the industry, that has always reinvested, to a high degree, its total revenues.

We have made an analysis of the annual survey of oil and gas published by the Census Bureau for the period 1973 through 1977 which we cited in our testimony. We also made a comparison of the same data for the year 1956, which was the year of peak drilling for the industry, and the ratio for reinvestment at that time was approximately the same as it is today.

So throughout this period, we think that it has been clear that the industry has been doing this.

Another example is the relationship between the increase in the price of crude oil and natural gas and the level of expenditures for exploration and development. Again, I did not refer to it, but we have a chart in our testimony which we think dramatically illustrates this point. This chart only goes back to the year 1960, but you can trace the relationship back to 1946 and even beyond that, before World War II.

There has always been a very close relationship between the composite price of crude oil and natural gas and the dollars expended for exploration and development.

We do have the situation where one invests the money or pays the tax if he puts it in his pocket. We think it makes more sense to put that money back into the economy than have it go to the Treasury.

Senator WALLOP. Two years ago a number of officials in the Department of Energy were complaining, or were claiming, that we only have 1,100 drilling rigs available in the country. If we had any significant increase in prices, it would result in more dollars chasing after the same number of rigs, the same amount of drill pipe. It would not bring on any increase in activity.

Can you give us any idea in terms of number of rigs now available and the ability of the industry to both increase the rate of drilling and the available rigs?

Mr. SCOGGINS. That is correct. A couple of years ago there were many people who said the unavailability of rigs and pipe and other equipment was going to be the largest constraint on the ability of the industry to increase production.

In 1972, we had an inventory of approximately 1,380 rigs that were capable of being operated. At that time, only 1,100 were actually being operated.

That rig inventory has now grown to where we have almost 2,800 rigs available for use. The rig manufacturing and equipment suppliers have responded dramatically to the increased activity of the industry, to the higher prices. They have opened up new plants.

The same thing has happened with regard to capability for manufacturing drill pipe and tubing for the oil industry.

I do think it is significant that last year—last October 30, as a matter of fact, our active rig count peaked at 2,385. That is the highest level that we have experienced in 20 years in the United States.

It peaked at that point 1 week before the Natural Gas Policy Act was signed into law and then it dropped dramatically, continued to drop throughout the last quarter and into this year.

Historically, the last quarter of the year is the most active quarter for drilling. It was contrary to all historic trends.

We do think that the decline has bottomed out, now. The last 2 to 3 weeks it has been edging up a little bit and we now have approximately 2,000 rigs active in the United States.

We do have the rigs, we have the capability. What we do not have is sufficient capital and cash flow to utilize what equipment is available.

Senator WALLOP. Even in that climate with the proposed windfall profits tax, or excise tax, it would appear that that accounts for a permanent roll back in tertiary recovery prices. Would that not affect the drilling rate as well?

Mr. SCOGGINS. Very definitely.

A perfect example of this is the price of stripper oil that presently is selling for around \$18 a barrel in most locations and it varies from place to place, State to State.

Under the proposed tax, any amount above \$16 a barrel will arbitrarily be subject to a tax. It would be a permanent tax. The producer would immediately, upon effectiveness of the tax, have his revenues reduced.

It is technically a tax, but it has the same impact as a price rollback. In the future, as the world price continues to go up and the domestic price is subject to that tax, the amount subject to tax will increase. Eventually, the Government would be making more out of the barrel of oil than the producer would.

Senator WALLOP. On top of that, I assume that would lead eventually to a certain amount of stripper oil in the ground?

Mr. SCOGGINS. Very definitely. At any price there is going to be some oil that is uneconomic. Clearly, the higher the price, the less oil there is that will be left in the ground because it is uneconomic to produce.

We have wells okay that are being shut down because it costs more to operate the wells than the oil can get on the market. When those wells are abandoned for all practical purposes they are lost forever, because it costs so much more in the future to go back in and drill a new well at the current price of drilling than it would cost to allow the market price for that oil and keep it producing today.

Senator WALLOP. You have a two-pronged effect. Not only to leave a little more in the ground, but using the capital available.

Mr. SCROGGINS. That is correct. Each barrel lost that way will be made up for by a barrel of imported oil.

Senator WALLOP. Thank you.

Senator GRAVEL. Senator Dole?

Senator DOLE. I think you properly characterized the administration's proposal not as a windfall profits tax, but as an excise tax. Unless there is a change in the climate of the Congress—not only the Congress, but in the attitude of about 70 to 80 percent of the American people—there is going to be some kind of windfall profits tax. I am not sure how the tax will be resolved. Unless there is a vast change in public sentiment and a better understanding of how the tax works the tax will pass.

I am working on a proposal called the Energy Development Surtax. We have a small producer exemption of 1,000 barrels a day.

Where is the major new drilling activity occurring in the country now?

Mr. SCROGGINS. Surprisingly enough, it is occurring throughout the oil patch. There is a lot of activity in previously unexplored areas such as the overthrust belt in the Rocky Mountains and all through the Rocky Mountain area, the Western States.

Also, there has been significant new activity in some of the older producer States, Texas, Louisiana, Oklahoma, Mississippi. They are all experiencing substantial additional activity. It is essentially of two kinds. The higher prices have enabled producers to explore for some of the deeper geologic structures that are much more costly to drill and produce.

They have also made it profitable to go back in older areas where reserves maybe had been discovered in the past, but because they were relatively low-volume reserves and were not economic at a given price, but today would be economic. So you have two new kinds of activity, which we think is going to contribute significantly to our domestic production.

We are much more optimistic about the ability of the domestic industry to increase production than many others have indicated.

For example, we think the testimony presented by the first witness is somewhat conservative. We are confident if you get the Government off the backs of the independent producers and let them do their job, they will surprise everybody as to how much additional oil they will bring onstream.

Senator DOLE. You addressed in your statement—the position of those who oppose decontrol and those who say there is no oil and gas to look for. So why decontrol it. You say that you think there is a bright future for new production.

You also touched, I believe, on how much we might recover from so-called enhanced recovery methods.

Mr. SCROGGINS. One point, Senator, that was just touched on very briefly by the first witness, that does need some amplification. It has to do with already discovered reserves, but not today classed as part of our proved reserves. The designation of reserves as proved is somewhat a function of economics.

It involves determining at any given point in time how many barrels of oil in a given reservoir, or reserve, are likely to be producible with today's technology. Most people think when they hear the figure of proved reserves that that is the total number of barrels that someone has discovered in the ground, but the actual reserves are much larger than that.

One of the largest increments of potential additional reserves is in the area of known reserves but which are, today, subeconomic.

The USGS has published studies which show that reserves in this category are far greater than the total amount of what we have already produced. Those figures are not reflected in proved reserve figures.

If you included all of the known subeconomic reserves together with the proved reserves, that would give us estimated supply at 1976 rates of production somewhere around 50 years additional crude oil, as opposed to 15 to 20 years that was being talked about.

Senator GRAVEL. Is that chart in your testimony?

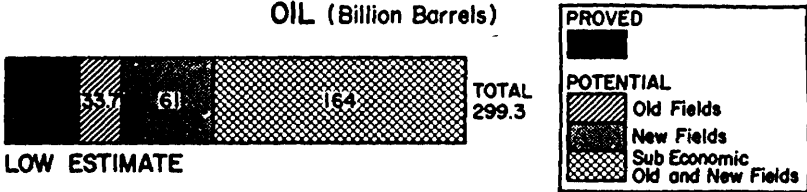
Mr. SCOGGINS. It is not. I do have a copy here, which I will submit for the record.

Senator GRAVEL. I sure would like to have it.

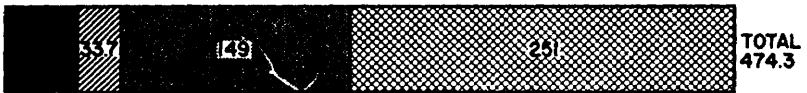
[The material referred to follows:]

## U. S. PETROLEUM RESOURCE BASE

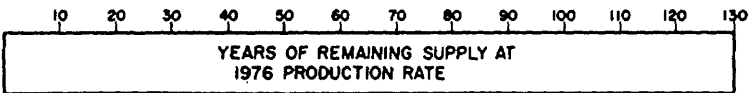
OIL (Billion Barrels)



LOW ESTIMATE



HIGH ESTIMATE



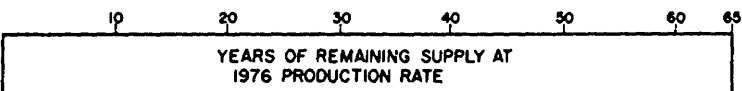
## NATURAL GAS (Trillion Cubic Feet)



LOW ESTIMATE



HIGH ESTIMATE



SOURCE: U.S. Geological Survey (1975). These USGS estimates do not include potentially large supplies in tight sands, shales, or geopressed reservoirs or from water depths greater than 660 feet.

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Senator DOLE. That is an interesting statement.

I want to touch on one other area. We have heard a lot of rhetoric and discussion about domestic energy companies acquiring nonenergy producing assets. The best example is the well-known department store.

As I look at the administration's proposal, there is nothing in it, if it were enacted, to prevent a company from using whatever money they had left from acquiring a nonenergy producing asset.

Do you see any restriction in the President's proposal?

Mr. SCOGGINS. As far as I can tell, there would be nothing that would restrict that.

Senator DOLE. I do not believe that there is anything that would prevent it being used for oil exploration outside of the United States.

Mr. SCOGGINS. That is correct.

Senator DOLE. So I do not believe that the product matches the rhetoric. It makes a good spot on the nightly news. However, in fact, tend to abandon their proposal, that you can invest the money outside the United States and also invest it in some nonenergy asset. Also, as we indicated earlier, the bill is not a windfall profits tax is an excise tax, not based on profit at all.

Mr. SCOGGINS. The tax, as presently designed, actually encourages investment outside the United States because for all of the production you are able to find and produce outside of the United States you still have that world market that is not subject to this tax.

There really is an encouragement to divert some of your drilling and exploration funds outside of the United States, whereas we should be in the situation which we have been in the past where those companies that do operate internationally are financing part of their domestic production with profit made in the overseas operations.

That is not something you read in the press, but it is a fact and easily ascertainable from the facts and figures.

Senator DOLE. You have already testified before the Ways and Means Committee?

Mr. SCOGGINS. Yes, sir.

We are convinced, if you give the American public all of the facts and let them make a decision based on their own interpretation of the facts, that the American public would very quickly opt for deregulation and get the Government out of the business of trying to regulate the industry.

As was pointed out by the last witness, it is the very existence of the regulations that, in many instances, have increased significantly the consumer's costs. But none of that money goes back into finding and delivering additional energy to the consumer.

That is exactly what would be the case under this tax proposal. The domestic producer is going to get the blame for all the increased price but not going to get the revenue, not going to be able to deliver it to the consumer, the additional energy that the consumer ought to expect for that additional price.

Senator DOLE. Apparently there is just a trade-off, trading decontrol for the excise tax. What is it going to mean as far as increased production?

Mr. SCOGGINS. We think it is a bad trade. We think the industry and country would be better off to continue under our present system than to propose a permanent tax that is going to grow larger with each passing year.

We think its going to be disastrous.

Senator DOLE. Thank you.

Senator GRAVEL. Looking at your chart again, you have an area that has proved—I understand what that means—proved reserves. Then you have another section that has old fields.

What is the difference between them? Why do you not walk me through?

Mr. SCOGGINS. The proved reserves are those reserves in known existing, producing areas which, at today's price and at today's technology, can likely be expected to be produced. The potential reserves, as you see, are divided into three categories: old fields, new fields and subeconomic. The potential in old fields means that there are a lot of new reservoirs that are yet to be found within existing, producing fields.

Each year, producers find a lot of new oil in many of the older areas. Some of it is found as a result of improved technology where they are able to go in and re-examine the logs from wells drilled in the past and make a better interpretation.

People will have the idea that there is a reservoir there that nobody thought existed before, went in to drill a wildcat well and found that.

Some of it is a result of pure chance. In looking for a deeper reservoir, they drilled through a reservoir that had not been known to exist before. There are many different ways in which you will find new reserves in old fields. Some of it is a result of simply being able to better calculate reserves as a result of getting experience in producing a reservoir.

Then you have the new fields, those where you go out and, through wildcatting, make a totally new discovery in an area that heretofore had not been producing. Your rank wildcat, you are out away from existing—

Senator GRAVEL. How is that computation made? On past performance?

Mr. SCOGGINS. It is based on a combination of factors. That takes into account the historic relationship between the rate of finding to the rate of drilling, to what is known about the basic geologic structure of the Earth and where potential oil and hydrocarbon bearing sediments lie and what percent of the Earth is underlain by these sediments, and a combination of these factors.

Some experience, some technology. Believe me, it is an art. It is not a science.

One thing that we have known from past experience is at any given point in time the amount of known, proved reserves that we have has never been more than 15 to 20 years supply, at present rates of production. That has been true throughout the history of the domestic petroleum industry for the last 100 years.

Yet people have always been saying, "we are running out of oil and gas." Ultimately we are going to run out. But that day is a lot further out than most people think it is.

Senator GRAVEL. And the subeconomic?

Mr. SCOGGINS. That is a category I referred to before. It is the largest increment of potential supply that constitutes those reserves in both known, existing fields, and new fields yet to be found, where the reserves at a higher price than today's price would be economic to produce.

It is a combination of both already discovered and subeconomic reserves in those reserves in yet to be found fields that will be subeconomic on the day on which the field is discovered.

Senator GRAVEL. This is all U.S.G.S. data?

Mr. SCOGGINS. That is correct.

Senator GRAVEL. These are U.S.G.S. calculations?

Mr. SCOGGINS. All these figures come from a study published by U.S.G.S. in 1975. I understand that they have recently indicated that they are likely to increase the estimated proved reserves significantly. They have not officially done it, but there has been literature in the trade press to indicate that they are moving in this direction.

This is something again, which happens all the time. The U.S.G.S. and all of us who are involved in estimating reserves make constant revisions, as technology increases, as the experience in producing known reservoirs increases, and people are better able to estimate what their reserves are.

They make adjustments.

Each year, there are adjustments, both up and down, in the actual reserve figures.

Senator GRAVEL. Thank you very much. I appreciate your testimony. It has been helpful to us.

[The prepared statement of Mr. Scoggins follows:]

STATEMENT OF INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA BY  
HAROLD B. SCOGGINS, JR.

I am Harold B. Scoggins, Jr., general counsel of the Independent Petroleum Association of America, a national organization of Independent petroleum explorer-producers having some 5,100 members in every producing area of the Nation.

We are joined in this statement by the 29 unaffiliated oil and natural gas production organizations listed on the cover of our testimony. These organizations have an aggregate membership that includes most if not all of the 10,000 independent producers in the Nation.

We appreciate very much the opportunity to appear here to discuss the issues under consideration by this committee: The proposed permanent excise tax on domestic crude oil, the energy trust fund concept, and the disallowance of percentage depletion to small producers on incremental price increases that would occur under the administration's phased decontrol of crude oil.

In my statement, I will delineate some consideration which—in our view—clearly demonstrates that the so-called "windfall profits" tax, which in no way is related to profits, is an ill-considered policy which ought to be rejected in both the short and long-term interest of the Nation. In addition, I want to speak generally to the persisting charges that domestic oil producers are profiting inordinately from the Nation's energy problems, and the false contention that petroleum prices are a major factor contributing to the inflation now troubling all Americans.

On May 8, the membership of our association adopted a policy statement following some 3 days of discussion and considered judgment of the proposed "windfall profits" tax. A copy of that statement is attached to my testimony.

The tax as proposed, like so much of the legislation of the recent past affecting independent producers, is so highly complex that it would increase the confusion and uncertainty already existing. Producers would continue to sell multiple categories of oil at a multiplicity of prices. But, in addition, all categories would be taxed at different rates. This system would be a trap in which honest mistakes would be unavoidable, and a briar patch in which dishonest opportunists could employ their imaginations.

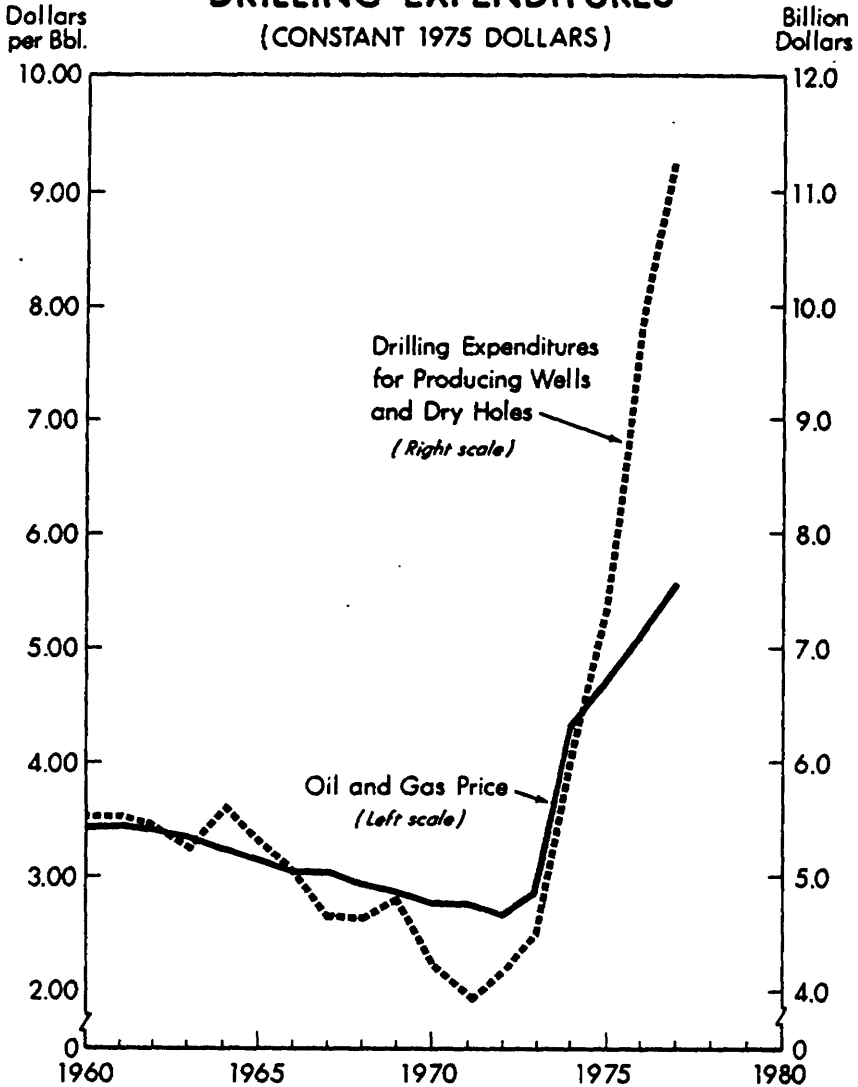
Structurally, the tax would be a nightmare of complexity to individual producers and their purchasers.

Economically, the tax would be an impediment to the exploration and development now needed to produce the increased energy supplies required by the American people and by our troubled economy.

Strategically, and this is by far the most important consideration, it would increase rather than reduce our already unacceptable dependence on foreign oil. With the present level of dependence, it is clear that even a partial disruption of U.S. imports for any sustained period would cripple the Nation economically. Our country has no greater imperative than effectively meeting the challenge of developing its own abundant energy resources.

Government energy policy controls the economic climate for energy development, and Government policy since the 1973 embargo has been directed unerringly at constraining domestic development and production and encouraging greater

## U.S. OIL AND GAS PRICES vs DRILLING EXPENDITURES



Source: U.S. Department of Energy and  
Chase Manhattan Bank

IPAA Chart  
May 1979



import dependence. It should be a surprise to no one, therefore, that import dependence has grown from 30 percent to 50 percent under the prevailing policies in just 5 brief years.

Adoption of the "windfall profits" tax would constitute another action limiting domestic energy resource development. The economic reasons are not so mysterious that they preclude rational analysis and commonsense conclusions. The domestic petroleum industry has a long history of economic experience which has demonstrated conclusively that increased wellhead prices always have resulted in more exploration, more drilling, and more production of oil and natural gas than otherwise would have occurred.

For example, in the period since World War II, every 10-cent change in the per barrel price of domestic oil and gas has been accompanied by a change of about \$120 million in expenditures for exploration and development. In the past 2 years, these expenditures have increased beyond historical experience by exceeding substantially their relationship to prices that persisted in the previous quarter century. (See chart: U.S. oil and gas prices versus drilling expenditures.) This proves what most economists would postulate: That producers of a material in short supply have strained their economic and physical resources to increase supply of that material.

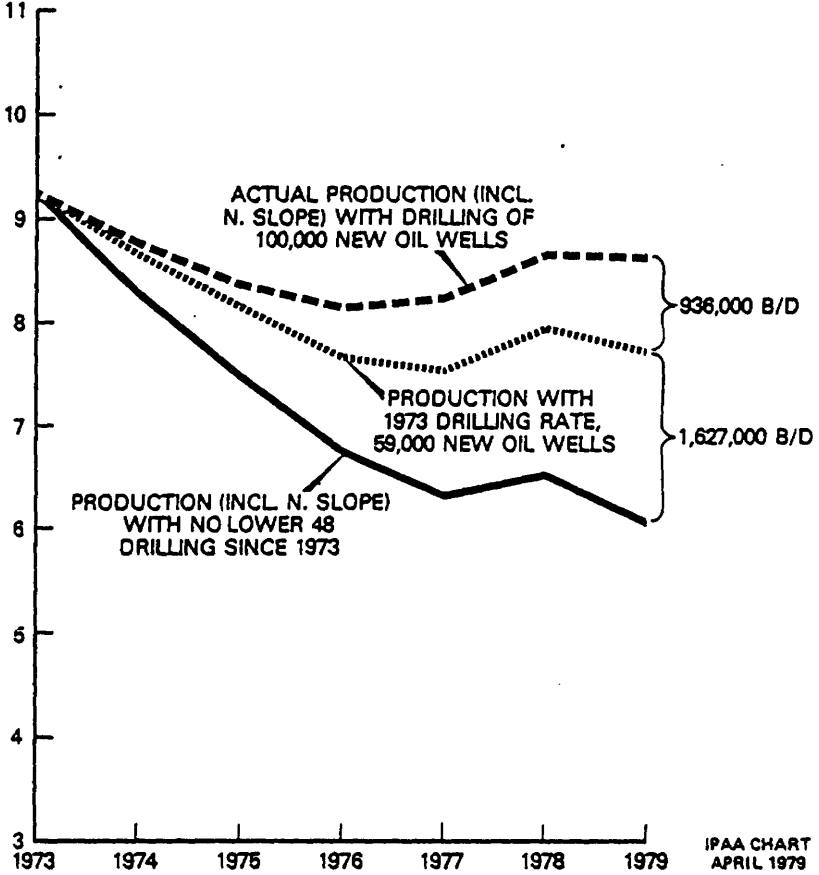
Let us look briefly at the supply response which has occurred. In the 5 years since 1973, we have drilled and completed 100,000 new oil wells in the United States. Had we continued to drill at the 1973 level, only 60,000 wells would have been completed. By drilling 40,000 additional wells, the industry will have added almost 1 million barrels daily to 1979 producing capacity above that which otherwise would have been produced. (See chart: Impact of drilling on U.S. crude oil production.) Except for this substantial additional effort, in other words, our imports of oil in 1979 necessarily would be about 1 million barrels per day higher. Except for this additional drilling, primarily by independent producers, Alaskan North Slope production would have had no material effect in offsetting the decline rate of old wells in the lower 48 States.

Despite these efforts, under these circumstances we have not drilled enough. Production continues to decline. Our reserves continue to drop. It is therefore clear that the higher drilling rate of the past 5 years must be greatly expanded.

Against this clear need for a greater drilling effort, the domestic industry is currently experiencing the sharpest drilling slump in 20 years. A number of factors have contributed, a significant one being progressively inadequate wellhead revenues under the Energy Policy and Conservation Act (EPCA). The provisions of that act have been administered so as to limit industry revenues from crude oil sales to \$5 billion less than authorized by Congress. Adjusted for inflation, crude oil prices have been controlled by the Department of Energy at progressively declining levels. By contrast, since 1975 when EPCA was adopted, the cost of drilling and equipping wells in the United States has increased 45 percent. (See table: Cost index of drilling and equipping wells.)

# IMPACT OF DRILLING ON U.S. CRUDE OIL PRODUCTION (MILLION BARRELS DAILY)

(MILLION BARRELS DAILY)



## COST INDEX OF DRILLING AND EQUIPPING WELLS

[Unadjusted for depth; 1974=100]

	Weight (percent)	1973	1974	1975	1976	1977	1978 <sup>1</sup>	Percent increase 1977-78
Payments to drilling contractors.....	36.6	77.0	100	120.0	131.1	157.1	178.6	13.7
Purchased items:								
Road and site preparation.....	4.1	93.2	100	110.8	119.4	128.7	133.8	4.0
Transportation.....	3.9	90.1	100	108.8	115.4	123.6	140.6	13.8
Fuel.....	1.1	57.2	100	121.6	141.3	171.4	183.3	6.9
Drilling mud and additives.....	6.9	84.4	100	127.7	143.4	151.1	179.2	18.6
Well site logging and/or monitoring system.....	1.2	87.7	100	117.5	126.1	136.2	154.5	13.4
All other physical tests.....	.7	88.4	100	120.3	135.4	148.7	163.5	10.0
Log and wireline evaluation services.....	3.2	89.9	100	118.1	137.9	152.5	175.0	14.8
Directional drilling services.....	.6	87.8	100	106.6	116.3	176.2	141.3	12.0
Perforate.....	1.1	89.8	100	118.3	131.0	143.1	155.2	8.5
Formation treating.....	3.0	93.4	100	126.6	137.3	144.0	154.3	7.2
Cement and cementing services.....	3.7	92.1	100	124.6	133.7	137.1	152.4	11.2
Casing and tubing.....	17.5	73.6	100	111.2	120.3	132.6	147.6	11.3
Casing hardware.....	.7	73.6	100	111.2	120.3	132.6	147.6	11.3
Special tool rentals.....	3.1	89.8	100	115.0	127.2	139.1	153.1	10.1
Drill bits and reamers.....	1.6	87.7	100	124.3	134.3	147.9	165.6	12.0
Wellhead equipment.....	1.8	85.6	100	120.5	141.5	165.2	184.2	11.5
Other equipment and supplies.....	2.0	84.4	100	124.4	138.0	149.9	165.7	10.5
Plugging.....	.5	93.1	100	115.0	122.0	128.0	140.3	9.6
Supervision and overhead.....	2.1	87.8	100	110.8	119.5	129.3	143.8	11.2
All other expenditures.....	4.6	81.9	100	111.5	118.5	126.9	136.1	7.2
Subtotal purchased items.....	63.4	83.5	100	116.4	127.4	138.3	154.0	11.4

<sup>1</sup> Preliminary.<sup>2</sup> Revised.

Sources: Weights from IPAA COST Study Committee survey of distribution of expenditures in drilling and equipping wells in 1974. Index of payments to drilling contractors from IPAA annual survey. Price indexes from Bureau of Labor Statistics and other Government publications, and data provided IPAA Cost Study Committee by service and equipment companies.

The recent decline in drilling must be reversed. Total drilling in the United States can and should be doubled in the 1980's. But this can only occur under Government policies which improve the economic climate for high-risk investment. Enactment of the so-called "windfall tax" on domestic crude oil would permanently cloud, rather than improve, this investment climate.

What are the possibilities for improving domestic oil supply and reducing import dependence? Our association in the past few months developed and recommended a program of phased decontrol of domestic crude oil. Specifically, we urged decontrol of upper tier oil effective June 1, 1979, and phased deregulation of lower tier oil by October 1981 as called for in EPCA. This would have had negligible impact on the economy—our estimate being 0.1 percent impact on inflation this year, and 0.3 percent in 1980 and 1981. (See table: Economic impact of IPAA decontrol plan.)

However, the increased revenues to producers—recycled in exploration and drilling as has occurred in all past experience—would materially have improved our productivity. Based on the consistent reinvestment, success ratios and productivity per new well during the past 5 years, new production under the IPAA proposal would have reached more than 400,000 barrels a day by 1981 and about 2 million barrels daily in 1985.

The gradual decontrol proposed by the administration, in the absence of the proposed "excise tax," would elicit a supply response not materially different from that which would occur under the IPAA recommendations. In addition to the production response, phased decontrol would result in real conservation of 1 to 1.2 million barrels daily by 1985. The combination of increased production and reduced consumption would curtail U.S. oil imports some 3 million barrels daily below the level otherwise required by the mid-1980's.

## ECONOMIC IMPACT OF IPAA DECONTROL PLAN

	1979 <sup>1</sup>	1980	1981 <sup>2</sup>
Incremental decontrol revenues (billions).....	\$1.9	\$6.8	\$8.2
Supply response:			
Additional E. & D. expenditures (billions).....	\$0.6	\$2.5	\$3.6
Additional wells drilled.....	1,600	5,600	7,400
Additional crude oil and natural gas (million barrels oil equivalent per year):			
Production.....	9	75	148
Reserves added 1979-81.....		1,040	
Economic impact: <sup>3</sup>			
Gross national product (billions):			
Deregulation.....	\$2,311	\$2,578	\$2,883
Continued regulation.....	\$2,309	\$2,571	\$2,869
Difference.....	\$3	\$7	\$14
Inflation (as measured by the Consumer Price Index):			
Deregulation.....	8.0	7.2	7.1
Continued regulation.....	7.9	6.9	6.8
Difference.....	0.1	0.3	0.3
Unemployment (percent):			
Deregulation.....	6.6	6.8	6.3
Continued regulation.....	6.6	6.7	6.3
Difference.....	0	.1	0
Federal deficit:			
Deregulation.....	-39.2	-26.9	-17.0
Continued regulation.....	-40.2	-28.6	-19.1
Difference.....	1.0	1.7	2.1

<sup>1</sup> June 1 through Dec. 31.

<sup>2</sup> Jan. 1 through Sept. 30.

<sup>3</sup> Based on Data Resources, Inc., macroeconomic model of the U.S. economy.

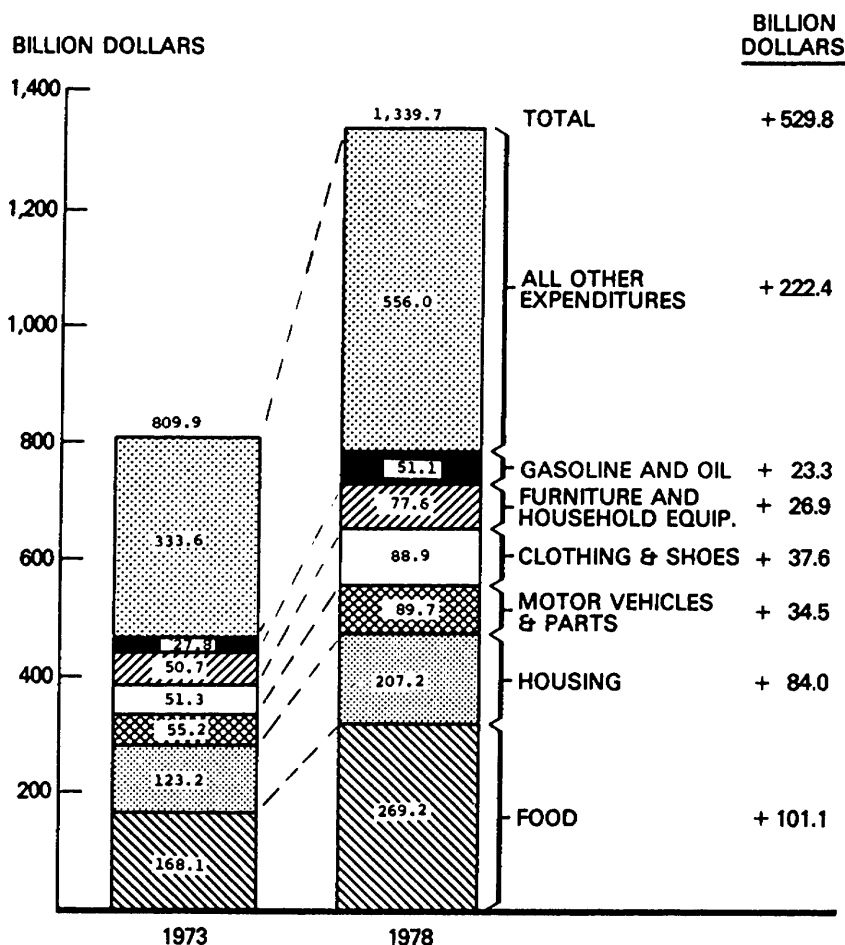
In the period 1979-85, the Chase Manhattan Bank now estimates that just to replace domestic reserves produced currently will require capital expenditure of \$350 to \$400 billions. This compares with total expenditures of less than \$100 billion in the past 7 years. The bank further estimates that the proposed "windfall" tax would siphon off up to \$40 billion of the funds needed in this period, leaving the industry with the "impossible" task of raising \$100 billion in outside capital in just the next 6 years—over and above the very large expenditures from internally generated funds.

It will not be easy to induce such unprecedented commitment of capital resources even in the most favorable political and economic climates. It will be impossible unless there is soon a clear and positive signal from the Federal Government, including the Congress, that energy investors will be able to make decisions in anticipation of market prices without punitive taxes or arbitrary controls. Congress is overdue in giving market pricing a chance. If the rewards do not outweigh the costs, controls always can be reimposed.

Now I would like to try to put into perspective some of the current and unfortunate misconceptions about the domestic petroleum producing industry; first, that oil prices have been a major factor in the current inflation rate, second, that oil companies are realizing profits that are above normal and out of line.

On the first point, President Carter's Economic Report to the Congress reveals some interesting comparisons. While petroleum prices have been subjected to political criticism for their presumed inflationary impact, the President's report put them in focus in relation to other major costs experienced by the consuming public. I refer to the chart, "Personal Consumption Expenditures, 1978 versus 1973," illustrating facts from Mr. Carter's economic report which show that:

## PERSONAL CONSUMPTION EXPENDITURES 1978 vs 1973



SOURCE: 1979 ECONOMIC REPORT OF THE PRESIDENT

IPAA CHART  
APRIL - 1979

Compared with 1973, the total 1978 consumer outlays for gasoline and oil were up \$23 billion.

But in the same period: Furniture and household equipment was up about \$27 billion; clothing and shoes were up \$37.6 billion; housing costs were up \$84 billion; and food costs increased \$101 billion.

The increased cost of gasoline and fuel was less than a third of the increase in the cost of housing and only one-fourth of the increase in food costs—but it is oil producers who are singled out for political vilification, and for taxes on imaginary "windfall profits."

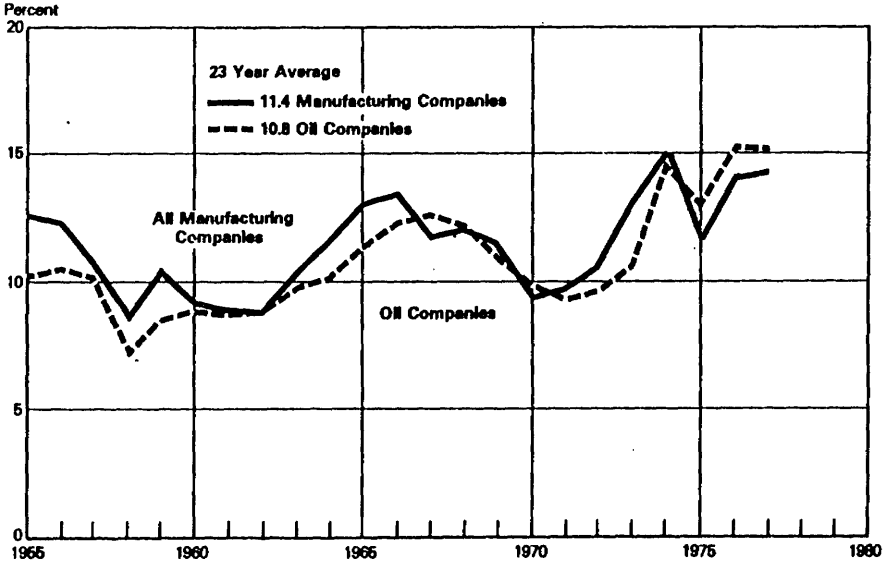
It is clear from the President's own figures that if "windfall profit" taxes were applied to compensate for cost impacts on the economy, petroleum would not be first, but far down in line for such treatment.

Now, I would like to briefly present some facts which tend to put "profits" of oil companies in perspective. The chart, "Rates of Return: Oil Companies Vs. All Manufacturers" shows that for 23 years ending in 1977, rates of return on oil investments have been below the average of more than 500,000 manufacturing companies reporting to the Securities and Exchange Commission.

### BEST COPY AVAILABLE

There has been a great deal of concern expressed over first quarter 1979 profits of oil companies, individually and collectively. The May 7, 1979, issue of U.S. News & World Report contains some figures on comparative first quarter profits among various industries. Average petroleum profits were reported to be up 57 percent, which sounds impressive. But the profits of paper companies were up 100 percent, railroad profits were up 190 percent, non-ferrous metals up 350 percent, and the profits of steel companies up 4,282 percent.

### RATES OF RETURN OIL COMPANIES vs. ALL MANUFACTURERS



A quarterly profit gain or loss is inadequate in measuring the financial condition of a company or an industry. If this were not so, oil companies—again—would be far down the line as candidates for taxes to rectify “windfall profits.”

Finally, Fortune magazine for May 7 contained some illuminating data on which companies did the best—and worst—on total return to investors, which is a measure of both price appreciation and dividend yield to investors in stock. In total return to investors, no oil company appeared in the top 10 companies among the Fortune 500. The median average for industries showed that broadcasters and motion picture producers topped the list with a total investor return of 33.34 percent. Aerospace was next with 28 percent, and 16 other industries reported better total investor returns in 1978 than mining and crude oil production which averaged 1.67 percent. This is not oil company “propaganda,” but a factual statistical report from a national magazine.

The facts I have just recited show conclusively that there has been considerable demagoguery by those who have singled out oil company profits for public condemnation. These reports, also, reflect the earnings and financial returns of the largest, most efficient, most successful companies in the petroleum producing industry. The smaller and less efficient do less well, but bear the brunt of negative actions designed to limit the perceived profitability excesses of “the oil industry.”

Legislative action based upon these misconceptions has greater negative impact on independent producers than for the industry overall. While the major integrated companies derive revenues and profits from diverse operations around the world, the independent producer derives all of his revenue and profit in one country—the United States of America—and from one activity—the wellhead sale of crude oil and natural gas. Thus, any change in the wellhead price of domestic crude oil and natural gas or the domestic rate of inflation, and especially any change in the tax treatment of income from oil and gas production has an immediate and direct impact on the ability of independent producers to contribute to the energy needs of this country.

Many people mistakenly believe that once a well is completed and begins production, the costs of operation are little, or none. While operating and production costs can vary greatly from well to well, all wells require frequent attention and maintenance.

In 1974 there were 621,349 producing wells in the United States on which producers spent \$5.6 billion in production and operating costs. In 1977 there were 653,474 producing wells, an increase of 5 percent, but costs of production had increased 55 percent to \$8.7 billion.

This clearly demonstrates that exploration and development of crude oil and natural gas reserves is still a highly risky business—a business for which a non-integrated independent producer cannot generally borrow funds. Because the capital of independents is derived principally from their internal operations, it is clear that revenues must be adequate to provide both the incentive for investment in exploration and drilling activity and the current cash flow necessary to:

- (1) cover the continuously escalating cost of maintaining production of old wells;
- (2) pay the increasingly heavy tax burden imposed by both state and federal governments on independent producers;
- (3) Cover the cost of all of the dry holes and commercially unsuccessful producing wells;
- (4) Provide a livelihood for the independent producer and his family; and
- (5) Finance the new exploration and drilling activity required to bring on future production.

Throughout the period 1957-71, the volume of oil production by independents remained relatively stable. The cost of both drilling and production increased steadily, but the price of oil actually declined throughout much of this period and did not regain its 1957 level in real terms until 1974. The independent, totally reliant on revenues from domestic oil and natural gas prices, was caught in a severe cost-price squeeze, forcing reduced spending for exploration and development. Even though exploration and development outlays by the major companies increased throughout this period, domestic drilling plunged from a 1956 high of over 58,000 wells to a low of 27,300 in 1971. Some 10,000 producers were forced out of the business during this period.

When crude rebounded in the early 1970's exploration and development spending rebounded also and domestic drilling began a dramatic turnaround. Analysis of the Bureau of Census' Annual Survey of Oil and Gas reveals that for the years 1973-1977 independents reinvested over 100 percent of gross wellhead revenues in exploration, development and production activity.

All of the publicity and rhetoric and the example of the impact of the tax furnished by the Administration and news media have dealt with circumstances typical of major integrated corporations. However, a great majority of independent producers are not incorporated and will be impacted much more severely than has been indicated. The Treasury Department prepared a table which was released with the President's message to Congress illustrating the effect of the decontrol schedule both with, and without, the wellhead severance tax. Most producers, rather than being taxed at corporate rates are subject to the 70 percent personal income tax. Even without the excise tax, the average independent producer will net only 21½ cents of each additional dollar in gross revenue rather than the 43 cents shown in the Treasury example. With the excise tax, the independent would net 17½ cents rather than the 29 cents depicted by the Treasury Department. That is a significantly greater impact than you have been lead to believe to be the case and obviously would have a significantly detrimental impact on future exploration and drilling activities of independent producers.

Independents would be further impacted negatively by the proposed denial of percentage depletion on that portion of the price increase subject to the excise tax.

There has been little if any attention given to the fact that in the period 1981 through 1984, the tax burden of Independents will be increased by as much as 32 percent as a result of tax changes already enacted. This can be expected to have a detrimental effect on exploration and drilling activity similar to that experienced following the 1969 reduction in the percentage depletion rate. In the following year, 1970, the number of wildcat wells drilled declined by 21 percent—the largest drop in exploratory drilling in a single year in history. Exploration activity did not recover to the 1969 level until 1977 even though wellhead prices increased significantly beginning in 1974.

There has been considerable discussion about the establishment of a plowback provision for insuring that the additional revenues derived from decontrol of crude oil prices will be utilized for new exploration and drilling activity. As previously demonstrated, independent producers in particular have always reinvested their gross revenues in both good years and bad. There is absolutely no reason to impose

such a requirement and indeed it simply won't work. Congress has previously attempted to fashion such plowback provisions. As yet, no one has been able to design a mechanism which is equitable and administratively enforceable or indeed even capable of implementation.

	Impact on typical unincorporated independent	Estimated effect of taxes and royalty payments <sup>2</sup> on revenue increases to producers
<b>Without windfall tax:</b>		
Amount.....	\$1.00	\$1.00
Royalty.....	-.14	-.14
Total.....	.86	.86
Severance tax.....	\$.125	-.05
Total.....	.785	.81
4 percent State income taxes.....	-.03	-.03
Total.....	.703	.78
Federal income tax.....	\$.49	\$.35
Net to producers.....	.215	.43
<b>With windfall tax:</b>		
Amount.....	1.00	1.00
Royalty.....	-.14	-.14
Total.....	.86	.86
50 percent windfall tax.....	-.43	-.43
Total.....	.43	.43
Severance tax.....	\$.125	-.05
Total.....	.305	.38
4 percent State income taxes.....	-.02	-.02
Total.....	.285	.36
Federal income tax.....	\$.20	-.16
Net to producers.....	.085	.20
Adjustment to reflect revenues from released lower tier oil not subject to the lower tier tax.....	.09	.09
Overall net to producers through Oct. 1, 1981.....	.175	.29

<sup>1</sup> Example prepared by IPAA for producer in Louisiana where State severance tax is  $\frac{1}{4}$  of wellhead value. A 70-percent marginal Federal income tax rate is used.

<sup>2</sup> Example supplied by U.S. Treasury Department and included with White House Fact Sheet released Apr. 26, 1979.

<sup>3</sup> One-eighth.

<sup>4</sup> 70 percent.

<sup>5</sup> A 45-percent marginal Federal income tax rate is used here because it is applied to taxable rather than gross income.

A reinvestment requirement would cause further cash flow problems. Producers must have the cash from present production in hand to make the expenditures to earn credits. If the excise tax is withheld by the purchaser, the producer must borrow cash to make his qualified expenditures—something which usually cannot be done by independents.

I would like to comment briefly on the very substantial role of the 10,000-plus independent oil and gas producers, then discuss the relatively limited means independents have of financing their high-risk operations, and, finally, express our concern as to how and to what degree the proposed "windfall profits" tax would impact on independents in particular.

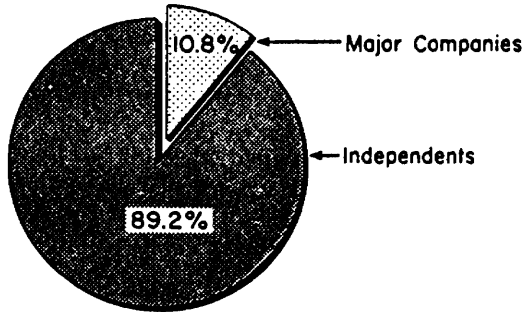
I refer to the chart "Role of Independents" which reflects the results of a study by the American Association of Petroleum Geologists as to who did what in U.S. petroleum exploration, development and discoveries in the years 1969-73. As can be seen, independent producers accounted for about 90 percent of rank wildcat wells, some 75 percent of new fields found, and about 54 percent of the oil and gas found in this period when a total of 147,000 wells were drilled in the United States.

In the next 5 years, 1974-78, drilling was significantly increased to a total of 208,400 wells. As can be seen from the next chart (1978 Well Completions) based on data from Petroleum Information Corporation, independent producers continued to drill 90 percent of the wildcats and completed 85 percent of a much larger number of total wells.

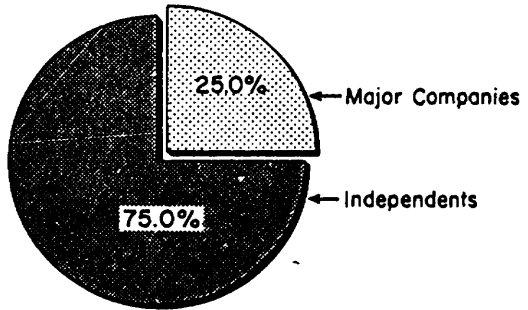


# ROLE OF INDEPENDENTS

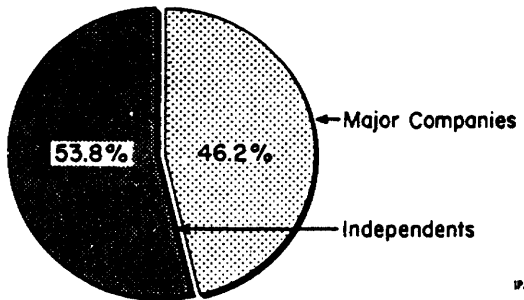
**WILDCAT  
WELLS  
DRILLED**



**NEW FIELDS  
FOUND**



**OIL & GAS  
RESERVES  
DISCOVERED**

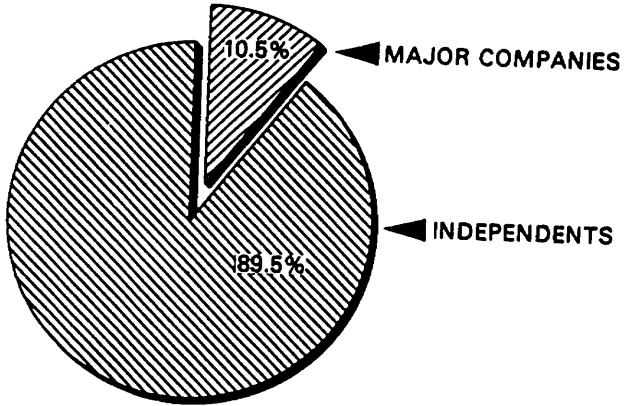


Source: American Association of  
Petroleum Geologists

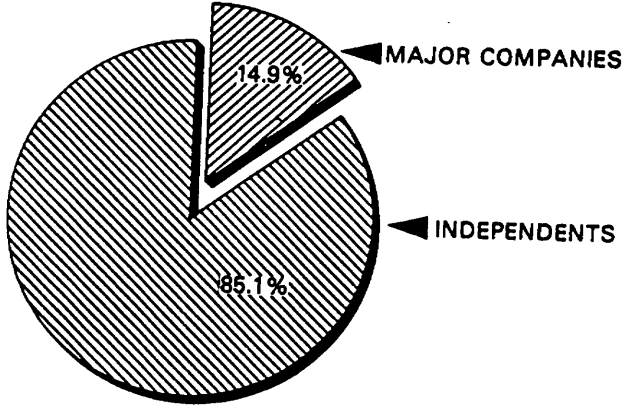
IPAA Chart

# 1978 WELL COMPLETIONS

**NEW FIELD  
WILDCATS  
DRILLED**



**TOTAL WELL  
COMPLETIONS**



Source: Petroleum Information Inc.

IPAA Chart  
April 1979

**BEST COPY AVAILABLE**

This vital role by independent producers is reflected in the production results. In contrast to the decade of the 1960's when independent producers as a group declined in number and saw their share of U.S. production erode persistently, independents have increased their share of U.S. production through their intensified drilling efforts since 1973. (See chart: U.S. Crude Oil Production).

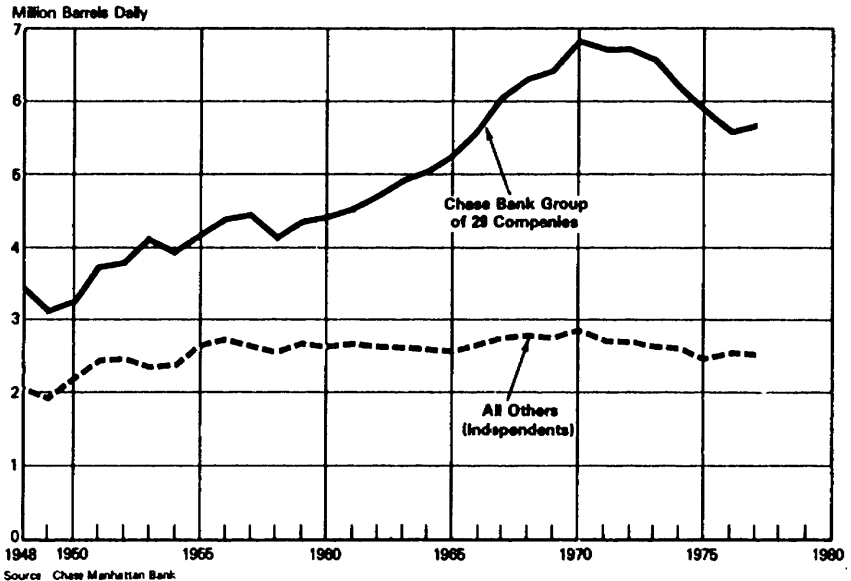
While all U.S. production has declined because of inadequate exploration and drilling, the production of the 29 largest companies—the so-called "Chase Manhattan group"—has dropped by 900,000 barrels daily from 1973 to 1977, while the production of all other producers has declined only about 100,000 barrels daily.

When there is a negative impact on drilling, the independent is the first to curtail operations, because he simply and understandably is most vulnerable to adverse economic developments. During the cost-price squeeze that persisted from the mid-1950's to the early 1970's, the domestic petroleum producing industry was practically dismantled—drilling dropped from 58,000 wells to 27,000; 60 percent of the operable drilling rigs were deactivated; reserves of both oil and gas declined precipitously. The attached chart, "U.S. Exploration and Development Expenditures," shows that independents accounted for all of the decline in drilling outlays during this period. As the chart also shows, independents have participated aggressively in the increased drilling since 1973.

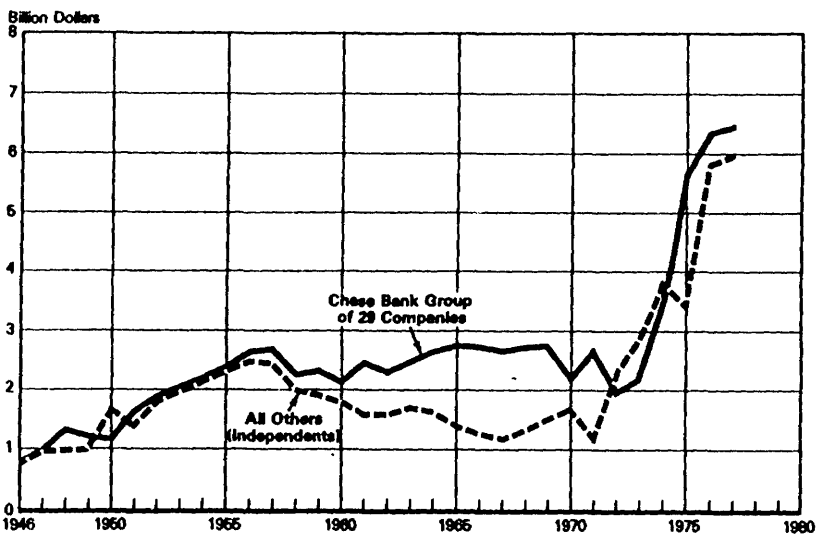
Unquestionably, independent producers as a group would be impacted critically by the proposed excise tax because it is structured to penalize most severely the production categories in which independents dominate.

For example, internal Department of Energy studies on control of the production categories existing under present controls show that the dominant 20 companies own only 40 percent of production from stripper wells now selling at market prices. Independent producers own most of the stripper oil, the price of which, in effect, would be "rolled back" and controlled permanently by the OPEC tax.

### U.S. CRUDE OIL PRODUCTION



## U.S. EXPLORATION & DEVELOPMENT EXPENDITURES



There are 369,000 wells in the "stripper" class and these wells on the average produce less than three barrels daily. Since Congress exempted these economically marginal wells from price controls, the number of well abandonments has dropped sharply. Market pricing has extended the productive life of every well in this category, and every additional barrel produced is a barrel which does not have to be imported.

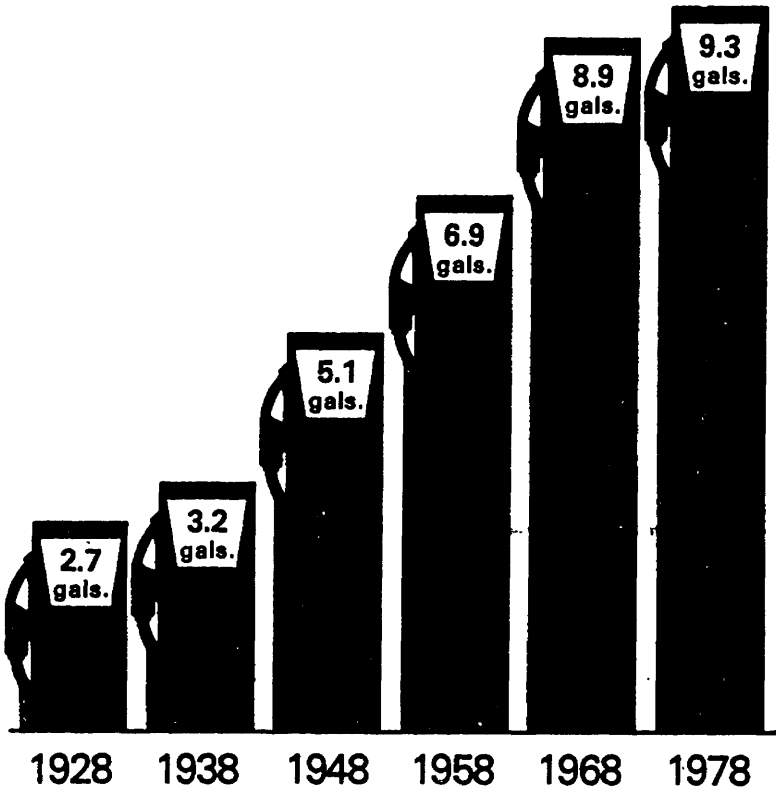
Subjecting stripper oil to a wellhead tax as suggested by the Administration would reduce the economic margin for every well in this category, advance the abandonment date for each well, and force consumers to export dollars to replace at world prices each barrel thus lost. This makes no sense, and there is no logical justification for such action.

I would like to call the Committee's attention to some facts which explain why gasoline consumption literally is going through the roof. The following chart shows how the gasoline purchasing power of the average American working man has increased over the past half century. As can be seen, the average wage-earner could buy more gasoline in 1978 than ever before. Despite some price increases this year, it is clear that we still are far from establishing a conservation ethic in America.

The experience we are having today clearly demonstrates a need to inhibit demand. Another recognized need is some means of alleviating the difficulties caused for the poor as a result of rising energy costs and prices. Neither of these problems will be addressed by penalizing crude oil producers and thus reducing future supply. The wellhead tax on crude oil would simply curtail domestic crude oil exploration, development and production. There is no way that such a result could serve the public or the national interest.

On the other hand, a tax on gasoline at the pump would inhibit demand, not production, and would just as effectively raise revenues for the purposes delineated

## ONE HOUR'S WAGE BUYS:



Note: Calculated by IPAA based on average hourly earnings published by U.S. Bureau of Labor Statistics and Retail Price of Regular Grade Gasoline (inc. tax) as published by Platt's Oilgram.

IPAA Chart  
April 1979

by the Administration. A gasoline tax would not be discriminatory; it would apply to the product from all crude oil, foreign and domestic. The gasoline tax could be applied selectively; to inhibit private pleasure driving and boating. Farm vehicles and essential public transportation could be exempted or rebated. The tax on crude oil, on the other hand, will be passed through to all consumers, including fuels for home heating, essential farm production, public transportation and petrochemicals manufacturing.

There are no redeeming features to the wellhead tax on domestic crude oil. It penalizes only domestic producers. It inhibits only domestic production. It will pass through, with no selectivity, to all consumers. Gasoline taxes would not be discriminatory against domestic producers, could be applied where consumption is out of hand to inhibit demand, and would yield any needed revenues. I strongly urge the committee to consider the fact that the "windfall" tax on crude oil production—where there are no "windfalls"—would be the most misplaced, counter-productive, and regrettable tax in history; especially when a gasoline tax would do more things far better without further discouraging production of critically needed raw materials.

I urge the Committee and the Congress to give careful thought to these considerations and to reject the proposed excise tax on crude oil which would simply replace an old economic constraint (arbitrary price ceilings) with a new one (punitive taxes).

Thank you.

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STATEMENT ON NATIONAL ENERGY POLICY BY THE INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA, RENO, NEV.

President Carter's proposal to begin the federal decontrol of domestic crude oil prices on June 1, 1979—under the authority granted him by Congress under the National Energy and Conservation Act of 1975—will have only beneficial effects on the U.S. economy. In absolute contrast, the President's companion proposal to impose an excise tax on all domestic crude oil production, the so-called "windfall profits tax," will have a significant negative impact on the economy that will cancel out the benefits of decontrol.

Standing alone, the decontrol proposal would:

(1) Increase domestic energy supplies, by removing the significant barriers to petroleum exploration and production fostered by burdensome regulations.

(2) Stabilize the cost of energy to American consumers in the decade ahead from the current projected trendline, as new domestic supplies flow into our markets.

(3) Remove the cloud that hangs over potentially higher-cost energy alternatives, including solar energy, which results when artificially controlled markets cannot first elicit lower-cost conventional energy sources.

(4) Decelerate the nation's growing dependence on high-cost, remote and insecure foreign oil.

(5) Increase private sector employment of tens of thousands of Americans in high value-added, high-wage jobs.

(6) Increase the standard of living of all Americans, insofar as less national wealth need be expended on acquiring foreign energy supplies.

(7) Signal the national government's confidence in private market solutions to economic problems, thereby removing a troubling cloud of increasing intervention from the entire private sector.

(8) Increase federal, state and local revenues, as increased domestic exploration and production leads to increased business income, personal incomes, royalties and land values.

The proposed excise tax will have precisely the opposite effects, more serious in that the temporary burden of regulatory controls on the industry would be replaced by a permanent financial burden on the industry. The per-barrel tax, which the President has found expedient to label a "windfall profits tax" although it does not tax profits, would have the following negative effects on the U.S. economy:

(1) Decrease domestic energy supplies, on the fundamental economic proposition that the more you tax something, the less you get of that thing.

(2) Decrease domestic energy supplies, by diverting financial capital away from exploration and production to commercial activities in which return on investment is not taxed away.

(3) Decrease domestic energy supply by diverting energy expertise—which cannot function without financial capital—into other enterprises.

(4) Increase imports of and reliance upon foreign energy supplies, inasmuch as foreign energy production does not bear the burden of the domestic excise tax.

(5) Increase energy costs to the domestic consumer as (a) domestic energy supply declines, and (b) the excise tax itself is entirely borne by the U.S. consumer, inasmuch as all taxes are ultimately borne by consumers.

(6) Insofar as the tax is viewed by markets as permanent, undiscovered reserves cannot be exploited in a meaningful way; insofar as the tax is viewed as temporary, financial capital will not flow to higher-cost energy sources—such as solar energy—which would become uneconomic upon lifting of the tax.

(7) Shift potential employment of energy industry employment into lower value-added, lower-wage employment, decreasing the standard of living of all Americans as more national wealth is expended on energy imports.

(8) Signal to the entire business community the national government's distrust of the private economy, the source of all the nation's wealth, to effectively and efficiently utilize capital resources to expand the nation's energy supply.

(9) Reduce federal, state and local tax revenues as the negative impact of the excise tax has rippling effects on commerce in general, eroding the real, national tax base.

(10) Tying excise-tax receipts to a Trust Fund, as is proposed, will create a new constituency that not only comes to rely on the Fund's continuing existence, but also becomes an advocate for its expansion.

These negative effects impact the 10,000 independent petroleum firms of America, which drill 90 percent of the exploratory wells, far more dramatically than they impact the major firms. The tax, after all, bears only on domestic production. The major, international firms have international profit centers that will not only cushion the effects of the excise tax, but may also expand as a result of domestic excise tax.

On these grounds, we recommend the President and his Administration revise its current energy policy, elevating their commitment to crude-oil deregulation and expediting the decontrol process, and at the same time altogether withdrawing the proposed excise tax. We further urge the U.S. Congress to reflect on these considered views of this Association and encourage the President on the course we recommend as being in the public interest of the people of the United States.

[Thereupon, at 12:30 p.m., the hearing in the above-entitled matter was recessed, to reconvene at the call of the Chair.]

# CRUDE OIL SEVERANCE TAX

MONDAY, JUNE 25, 1979

U.S. SENATE,  
SUBCOMMITTEE ON ENERGY AND FOUNDATIONS  
OF THE COMMITTEE ON FINANCE,  
Washington, D.C.

The subcommittee met, pursuant to notice, at 1:30 p.m., in room 1224, Dirksen Senate Office Building, Senator Mike Gravel (chairman of the subcommittee) presiding.

Present: Senators Gravel, Boren, Baucus, Chafee, and Wallop.  
[The press release announcing today's hearing follows:]

[Press release, Committee on Finance, U.S. Senate, Subcommittee on Energy and Foundations]

## FINANCE SUBCOMMITTEE ON ENERGY AND FOUNDATIONS ANNOUNCES HEARINGS ON BACKGROUND INFORMATION ON ENERGY AND TAXATION POLICY

Subcommittee Chairman Mike Gravel (D., Alaska) announced today that the Senate Subcommittee on Energy and Foundations will hold its fourth day of hearings on background information on energy and taxation policy. The Subcommittee anticipates that this hearing will contribute to the development of data necessary for the consideration of tax proposals related to domestic energy production.

*The hearing will be held on June 26, 1979, in Room 1224, Dirksen Senate Office Building. The hearing will begin at 1:30 p.m. Previous hearings were held on May 7 and 11, and June 11, 1979.*

*Legislative Reorganization Act.*—Senator Gravel stated that the Legislative Reorganization Act of 1946, as amended, requires all witnesses appearing before the Committees of Congress "to file in advance written statements of their proposed testimony, and to limit their oral presentations to brief summaries of their argument."

Witnesses scheduled to testify should comply with the following rules:

- (1) A copy of the statement must be filed by noon the day before the day the witness is scheduled to testify.
- (2) All witnesses must include with their written statement a summary of the principal points included in the statement.
- (3) The written statement must be typed on letter-size paper (not legal size) and at least 100 copies must be submitted by the close of business the day before the witness is scheduled to testify.
- (4) Witnesses are not to read their written statements to the Subcommittee, but are to confine their ten-minute oral presentations to a summary of the points included in the statement.
- (5) Not more than ten minutes will be allowed for oral presentation.

### WRITTEN TESTIMONY

Senator Gravel stated that the Subcommittee would be pleased to receive written testimony from individuals or organizations not scheduled to appear at the hearing. Written testimony for inclusion in the Record should be typewritten, not more than 25 double-spaced pages in length and mailed with 5 copies by July 7, 1979, to Michael Stern, Staff Director, Committee on Finance, Room 2227, Dirksen Senate Office Building, Washington, D.C. 20510.

Senator GRAVEL. The hearing will come to order.



This is one of a series of broad-stroke position hearings that we have been holding in the Subcommittee on Energy and Foundations of the Finance Committee in order to be able to develop a record so as to more intelligently handle the issue when it comes over the from House.

The full committee will hold hearings at that time, of a brief nature, but essentially the record on this subcommittee is what we are putting together in the number of hearings that we have had.

We have nine members on the witness list. We have notified witnesses that they are limited to 10 minutes. That need not be the case. If they feel that there is something important that they can't cover in that period of time, I am prepared to stay here to listen. I do notice that many of the statements are quite lengthy, which makes me happy, because it gives us a chance to approach the subject quite studiously, but, obviously, the statements should not be read in their entirety. They will be accepted for the record.

I would hope that witnesses would summarize those statements. I can assure the witnesses that I personally will be culling through this record extensively as part of my studies in preparation for the debates that will take place in the committee and, of course, on the floor of the Senate.

I am sure that much of the data presented will be brought to the attention of the other members of the Senate, the Congress, and the public through that dialog which will take place as the debate goes forward on this particular issue.

I am grateful to the witnesses who have taken their time in preparation of these documents, and we will start off with our first one, Mr. Frank Pitts, an independent oil producer, from Dallas, Tex.

It is a pleasure to have you here. I want to thank you personally for taking your time to come.

**STATEMENT OF L. FRANK PITTS, INDEPENDENT OIL PRODUCER,  
DALLAS, TEX.**

Mr. PITTS. Thank you, Mr. Chairman.

My name is L. Frank Pitts. I am an independent petroleum producer, as the chairman said, from Dallas, Tex. While I assume my remarks may mirror the opinion of other independent petroleum producers, I appear here today only as an individual.

What has been labeled "windfall profits tax" will have a very detrimental effect on me as an independent. The proposed tax will have its most devastating impact on independents; it will be basically meaningless to the large, integrated oil companies who will just pass the tax into their cost base and pass it on to the consumer through higher pump prices.

The independents cannot pass it on.

I have been in the oil and gas business now as an independent producer since 1943, 36 years. During part of this time I also served as chief executive officer of a geophysical exploration company; so we know what, in effect, an independent producer really is.

My definition of an "independent producer" is one who is in business of drilling exploratory and developmental wells and operating stripper and marginal wells.

Independents operate 80 percent of what the administration defines as "marginal wells," and conduct secondary and tertiary recovery programs as well.

An independent producer is not in the business of refining, transporting, or marketing oil products. Independents look for oil and natural gas, operate the wells, attempt to increase production from existing wells, and sell the oil and gas at the wellhead.

Over the last several years I have been involved in drilling somewhere between 90 and 100 wells a year. The majority of these wells were drilled looking for natural gas. I sought natural gas to be sold in the intrastate free market where the prices were not controlled. Not all of these wells are owned by me 100 percent. I have participated in the drilling and ownership of these wells with others.

In 1978 my drilling activities were such that, in a tax sense, my tax deductible expenditures and costs exceeded my income by approximately \$1 million.

Now, to do this overspending, I borrowed money on the production I had found previously. In other words, I had spent not only my original drilling dollars but also I spent in advance my future dollars, even before those dollars were produced.

Now, as a result, I went into the 1979 tax year with a loss carryover of more than \$900,000.

My experience tells me to believe that we have in this country a large amount of oil and gas yet to be discovered and produced. It will principally be deeper product and, while it may not be in fields the size of those found in the Middle East, there is a lot here still to be found; but in order to find that oil and produce the oil needed to provide ourselves with an economic stability for the period of the time necessary for us to develop alternative sources of energy, we must drill much more than the present rate of less than 50,000 wells a year; actually, last year, roughly 49,000.

We should be drilling 80,000 wells a year minimum, many of which must be deeper wells.

In the past few years, the average well drilled in this country has been approximately only 5,000 feet. Only 1.5 percent of the wells drilled in 1978, and that is roughly 49,000, were drilled in to 15,000 feet or deeper.

There is hard evidence that 98 percent of the potential areas in our country for oil and gas are still untested. I would like to repeat that statement: There is hard evidence that 98 percent of the potential areas in our country for oil and gas are still untested.

Attached to my testimony is a copy of a map of the south 48 and Alaska, which I believe accurately shows the basinal areas, offshore and onshore, and are the most potential areas to find oil and natural gas.

The major integrated oil and gas companies are not presently, and probably will not be in the future, drilling many of these needed new wells. The independents have in the past, and probably will in the future, drilled 90 percent of the exploratory wells in this country. In the past they could be expected to find—I am speaking of the independents—approximately 75 percent of the new production. Independent producers are very prominent in those classifications of domestic crude production that are aimed at increasing supply and thereby serve to reduce imports. It is therefore my opinion that further exploration, development, and increased production of this Nation's oil and gas reserves must rest with the independents. It is this segment of the oil industry which must be encouraged to perform the big part of the task.

Now, the proposal for the windfall profits tax bears an unfortunate connotation. This is not really a windfall profits tax; it is an excise tax on the production of oil, designed to finance projects other than the production of domestic oil also desperately needed by the Nation.

It is ironic that, with all the criticism that is being cast against the oil companies these days, the so-called windfall profits tax is a little more than a method by which the U.S. Government will share in those dollars from the sale of oil at world market prices at the expense of the American consumer.

It certainly seems to me, if the American consumer is going to pay the higher price—and they are—then they should be entitled to that money being spent trying to find more oil within our own country.

The windfall profits tax is a wrong approach; it is nothing more than a continued price control.

Controls have in the past, and will in the future, severely hampered the search for, and the production of, oil and gas. The only thing that has enabled us in the past to go forward with the discovery of natural gas reserves in this country has been the free intrastate market.

We have been told over and over and over by people in the political arena, very prominent in this country, that there is no more oil and gas to be found in this country; but we found it anyway. That system of the free intrastate market, while it existed, gave the independents the economic incentive to drill wells. They were drilled, and now we have a surplus of natural gas in Texas. One would think that the lesson from this would have been learned, but the proponents of this new excise tax are apparently determined to perpetuate the problems of shortages.

Anything that takes dollars away from exploration of oil and gas drilling in this country will backfire against the consumers. The windfall profits tax does take dollars away from oil and gas exploration.

Now, if the Government is serious about encouraging the promotion of domestic energy, you must allow the minimum funds to be reinvested in the exploration for oil, or in some cases, other forms of energy. The producer must also have the economic incentive to invest in secondary and tertiary programs and wells not abandoned before the end of their productive lives.

I am not personally opposed in principle to a tax on income from the sale of production where the funds are not reinvested in the search for energy; but since 1973, the independents have spent from 95.6 percent to 128.4 percent of their wellhead revenues annually for exploratory, development, and producing operations.

One comment about the practicality of the concept I hear referred to as "plowback" if a tax is levied:

If a tax is levied in conjunction with an incentive in the form of a plowback to the producer, then it must be crafted very carefully so that the independent is placed in the position of having the funds so that the funds are not taken away, and if required, apply for refund. He will probably be forced to borrow funds at a higher interest rate, if he can borrow on them, for the purposes of energy exploration.

This could be one more crippling obstacle added to the many already in his path.

If the proposed windfall profits tax is enacted without a provision allowing the reinvestment of these funds, there is no question but that the drilling activities will gradually diminish in this country.

Exploratory drilling will be the first to go.

Critics of the industry seem to forget that costs continue to go up, not only because of inflation but also because wells must be drilled deeper than in the past in looking for new reserves. At the present time, for example, the cost of a well will double for every 2,800 feet drilled.

For example, you can drill 10,000 feet, but if you want to carry it 2,800 feet deeper, that is, 12,800 feet, it costs you just as much to drill that last 2,800 feet as it did the first 10,000 feet. This tax might create a politically attractive trust fund, but it will deny the energy resources needed by our citizens.

I hope that most members of Congress have the objective of providing for this country all the energy resources possible until other alternative means of energy can be obtained, and we know that will take 15, 20, 25 years even if we are dedicated and put all the money behind it that is needed right now. To this end, I am sure this committee will recommend to the Senate a substantial improvement over the tax proposed by the administration and the House Ways and Means Committee because there is no question that oil and natural gas are 75 percent of the energy we consume in this country, and there are two types of energy that must bridge this gap 15, 20, 25 years before other sources of energy come on in any appreciable quantity.

Thank you very much.

Senator GRAVEL. You estimate about 98 percent of potential oil and gas areas are yet to be tested. Is that outside the total field of oil and gas that we already have discovered in the United States?

Mr. PITTS. Yes; about 2 percent of the total energy that we have found in oil and gas in this country has been found on roughly 50,000 square miles, which is roughly 2 percent of the 3 million square miles of potential basinal areas, and this map shows those basinal areas.

Senator GRAVEL. Repeat those figures more slowly.

Mr. PITTS. Of all the oil and natural gas that have been discovered in the United States to date, these discoveries have been on approximately 50,000 square miles of a total of 3 million square miles of potential basinal areas, that is, areas conducive to the accumulation of hydrocarbons, either oil or natural gas; therefore, 50,000 square miles are roughly equal to 2 percent—not quite but I use the 2 percent—and 98 percent of the sediment in this country that has potential oil and gas has not been tested to date.

Senator GRAVEL. Is that offshore and onshore?

Mr. PITTS. Offshore and onshore, yes. By the way, if you want to know where these basins are, they are on this map, and the sedimentary section and estimated depth. We have basin after basin after basin in the United States, onshore and offshore; 15,000, 25,000, 30,000 and even 40,000 feet of sediment has never been tested, yet last year we only drilled 1.5 percent of the total wells in this country to 15,000 feet. We have not scratched the surface to find oil and natural gas in this country.

Senator GRAVEL. I wonder if you might elaborate briefly on why you say this won't hurt the majors, why the tax won't hurt the majors but will hurt the independents?

Mr. PITTS. The majors have the ability to pass it on and increase the price at the pump. The producers, as I have, drill wells, find oil and natural gas and sell it at the wellhead. I have nothing to do with it after that. I have no other type of business except exploring oil and gas and selling it at the wellhead.

Senator GRAVEL. Would you elaborate on what the dynamics were of the intrastate market which has created what we call the gas bubble at this point in time?

Mr. PITTS. I can speak of Texas in particular. We had a shortage of natural gas, as did the country, back in 1973. Up until that time the price of intrastate natural gas in the State of Texas had followed very closely the price of the interstate market. As we all know, the interstate price of natural gas has been controlled by the Federal Government from 1954 to that date. It was unreasonably low. The price of gas was not sufficient to go out and drill for new wells.

When the shortage came, in the State of Texas we had factories close; we had some schools close, even the University of Texas was closed for a short time. What happened is that the price then began to increase. As the price increased, more wells were drilled. We found enough new gas to break the shortage and by the time the Natural Gas Policy Act was passed last year, we had a surplus, and still do.

Senator GRAVEL. Thank you very much, Mr. Pitts.

We have a vote on, but I think we have time for a few more questions.

Mr. WALLOP. I apologize for not having been here when your testimony began.

Is it your idea that there should be a differentiation between independents and the majors with regard to tax, if any?

Mr. PITTS. If Congress sees fit to put on a tax, in my judgment, yes. I am talking about the windfall profits tax as it is proposed. That is, if you want the wells drilled. Now, if you don't, if it is the wisdom of Congress not to have wells drilled looking for new oil in this country, then, fine. But if you want the energy found and want wells drilled, and that is the only way to get it; there is no wishful thinking to find oil, you have to drill for it.

Senator WALLOP. With regard to this Senator to whom you are speaking at the moment, my own State is one of those areas which is identified on your map, and in many other people's minds, as being one of the most promising areas in the country.

I agree with what you are saying. Let me ask you one other thing: If a tax of any kind is put on, would it be better to have it be a well-head tax rather than an excise tax?

Mr. PITTS. I am really not that much of an authority on taxation. All I am saying is, if you will let the producer have the money and then if he does not drill the wells, take it away from him. I don't object to a tax if it is not reinvested in trying to find more oil and natural gas in our own country. I think that is what we need. We need a drilling program the likes of which we have never seen in this country, so that we can develop these potential areas for our own use, rather than importing oil, in my judgment.

Any money that is taken away in tax means less money for drilling for oil and gas.

[The prepared statement of Mr. Pitts follows:]

#### STATEMENT OF L. FRANK PITTS

##### SUMMARY OF TESTIMONY

The oil and gas reserves in this nation yet undiscovered are significant. Those reserves can and must be fully utilized during the coming years until alternative means of energy are developed in order not only to provide us with energy, but with economic stability. The independent oil producers are the primary source of

exploration, development and production of these reserves. The needed exploration and development will occur if the financial incentives are sufficient. It will not occur if the incentives are taken away. A free market price will provide the financial incentive that is needed. A windfall profits tax will destroy that financial incentive. The choice is with Congress. Congress will be held responsible by the people for the result.

#### STATEMENT

Mr. Chairman and members of the committee, my name is L. Frank Pitts. I am an independent petroleum producer from Dallas, Texas. While I assume that I speak the position of many independent petroleum producers, I appear here today only on behalf of myself individually.

As you know, I am here to discuss what has been labeled a windfall profits tax and its effect on me as an independent. I assume that you now accept as a fact that this proposed tax will have its most dramatic impact on the independents, and that the tax will be basically meaningless to the large, integrated oil companies. These large companies will just add the tax into their cost base and pass it on to the consumer through higher pump prices. The independents cannot pass it on. In any event, I sincerely appreciate your giving me the opportunity to discuss with you this proposed tax and the effect it will have on my oil and gas operations. I look forward at the conclusion of my remarks to try to answer any questions that you might have.

First, let me discuss with you very quickly my background in the oil and gas business. I have been in the oil and gas business since 1943; 36 years. I have been an independent oil and gas producer during all of this time. During a part of this time I also served as chief executive officer of a geophysical company. I consider an independent to be one who is in the business of exploring for oil and gas by drilling exploratory and development wells, operating stripper and marginal wells, and operating in secondary and possibly tertiary recovery programs. An independent is not one who is in the business of refining, transporting or marketing oil products. Independents look for oil and natural gas, operate the wells, attempt to increase production from existing wells, and sell the oil and gas at the wellhead.

On the average over the last several years I have been involved in drilling somewhere between 90 and 100 wells a year. The majority of these were drilled looking for natural gas. I sought natural gas to be sold in the intrastate free market where the prices were not controlled. Not all of these wells are owned 100 percent by me. I have participated in the drilling and ownership of these wells with others.

From a dollar standpoint, in 1978 my drilling activities were such that, in the tax sense, my tax deductible expenditures and costs exceeded my income by approximately \$1 million. To do this overspending, I borrowed money on the production I had found—in other words, I spent not only my original drilling dollars, but I spent, in advance, my future dollars, even before those dollars were produced. As a result, I went into the 1979 tax year with a loss carryover of more than \$900,000.

An initial point that I suggest to you, and a point of fact which I firmly believe, is that we have in this country a large amount of oil and gas yet to be discovered and produced. While on the average it will be deeper production, and while it may not be found in fields of the like found in Saudi Arabia, Kuwait, Iran or other oil producing nations, there is a lot here to be found. But, in order to find that oil and produce the oil needed to get us back to where we should be and provide ourselves with an economic stability for the period of time necessary for us to develop alternate forms of energy, we must drill more and more wells. We presently are drilling less than 50,000 wells a year. We should be drilling 80,000 wells a year minimum, many of which must be deeper wells. In the past few years the average well has been drilled to 5,000 feet. Only 1½ percent of the wells drilled in 1978 were drilled to 15,000 feet or greater. In the future we must not only be drilling more wells, but we must be drilling more deeper wells in order to find and produce the significant amounts of oil and gas yet to be found in this country. I am convinced that we have only found production on 2 percent of the potential areas in the United States, including Alaska, and that 98 percent of our area that is potential for oil and gas is untested. I have attached to my testimony a copy of a map of the south 48 and Alaska which I believe accurately shows the basinal areas, offshore and onshore, that are potential areas to find oil or natural gas.

My next point is one that you are well aware of. The major integrated oil and gas companies that we read about in the papers are not at the present time, and will not in the future, be drilling many of these wells, whether there be 50,000 a

year or 80,000 a year. The independents have in the past and will in the future drill 90 percent of the exploratory wells in this country. As in the past, they will find approximately 75 percent of the new production. The independent is the primary specialist who extends the life of economically marginal production, squeezing out every possible barrel of known reserves. He owns more than 80 percent of the nation's stripper oil wells and probably half of the oil wells defined as economically marginal in the Administration's proposed oil tax. He is also disproportionately prominent in the operation of secondary recovery projects which, on the average, double the recovery of reserves from approximately 15 percent to 30 percent of known volume in the reservoirs of this country. Some independents have even begun specialization in new tertiary recovery methods, even though such projects are normally too expensive for independents to handle.

My general point, then, is that independent producers are very prominent in classifications of domestic crude production that are aimed at increasing supply and thereby serve to reduce imports. Therefore, if you are interested in the further exploration, development, and increase in production of this nation's oil and gas reserves, as I know you are, you must look to the independent to perform the big part of this task.

Turning now to the proposal for a windfall profits tax. If one is honest, he must acknowledge at the outset that this is not really a "windfall profits tax." It is a levy on the production of oil. This levy, in effect, gives to the Congress a fund. It is somewhat ironic, but with all the criticism that is being cast against the oil companies these days, that the so called "windfall profits tax" is nothing more than a method by which the United States government can participate and share in those dollars that are to be received from the sale of oil by the domestic producer at world market prices.

If you gentlemen are concerned with energy, as I am, and I know you are, then let's recognize why a "windfall profits tax" is the wrong approach. The tax is nothing more than a price control. Controls have in the past, and will in the future, severely hamper the search for oil and gas and all attempts to increase the production of oil and gas. The only thing that has enabled us in the past to go forward with the discovery of natural gas reserves in this country has been free intrastate market prices. Had the low, Federally-controlled interstate gas prices applied to all gas prices, we would have been in a worse position in natural gas than we are in oil today. However, because of the free intrastate market prices, we independents had the economic incentive to drill gas wells. They were drilled, and we now have a surplus of gas in Texas. One would think that a lesson from this would have been learned. But the proponents of a "windfall profits tax" apparently are not very astute students of the past.

Very simply, I believe that anything that will take dollars away from exploration of oil and gas drilling in this country is the wrong approach. And a "windfall profits tax" can do nothing less than take dollars away from oil and gas exploration. If you want more energy, you must not skim off the top, and limit the proceeds of the sale of oil. If you want energy, you must allow, and not limit, funds to be reinvested in the exploration for oil; or, if you wish, other forms of energy. You must leave with the producer the economic incentive, particularly to drill new wells, invest in secondary and tertiary programs, and operate and attempt to maintain and increase the recovery from marginal and stripper wells. It is imperative that one realize the magnitude of the oil produced from these low-volume producing wells and the absolute necessity that these wells not be prematurely abandoned before the end of their productive lives.

I personally am not opposed in principle to a tax on the income from the sale of production where the funds are not reinvested in the search for energy. However, a "windfall profits tax" on the independent producer is not necessary, because such investment and reinvestment by the independent producer will result voluntarily, if the economic incentives are there. This is not just speculation. Since 1973 the independents have spent from 95.6 percent to 128.4 percent of their wellhead revenue annually for exploratory, development and producing operations. Nonetheless, the important thing to me is that you provide for the oil producers—the independents—the ability to use those funds for further exploration and development of our oil and gas resources.

I make one comment which goes to the practicality of the concept you refer to as a "plowback." If you levy the tax, but also provide an incentive in the form of a "plowback" to the producer, then you must do it in a practical way. Do not place the independent in the position of having the funds taken away and make him apply for a refund. You would then place him in the position of having to borrow funds at high rates of interest, if at all, for the purposes of energy exploration and thereby place one more obstacle in his path.

I mentioned earlier that I would speak to the ultimate effect on a producer such as myself of a "windfall profits tax." If you proceed to enact a "windfall profits tax" without a provision allowing the reinvestment of those funds by the producer in order to eliminate the tax, the following will occur:

(1) There is no question but that drilling activities will gradually diminish in this country, rather than increase.

(2) Exploratory drilling will be the first to go, because the financial risks of exploratory drilling are so great. Critics of the oil industry continually mention revenues, but seem to forget the costs. These costs continue to go up not only because of inflation, but also because wells are being drilled deeper than in the past in looking for new reserves. As a fact, at the present time, the cost of a well will double every 2,800 feet drilled. If the rewards are lessened or restricted, the financial risks increase.

(3) Drilling will eventually cease.

(4) Perhaps you will have a trust fund, available for various political objectives, but you will not have the energy resources needed by our citizens.

I hope, and I know, that you gentlemen have as your objective the providing to this country of all the energy resources possible until other alternative means of energy can be obtained. If this is your objective, and I am confident it is, then I thank you for listening to what I have said.



Senator WALLOP. I think I will have to go vote as well. So, I will recess the hearing. The chairman and I will be right back. Thank you very much.

[Brief recess.]

Senator GRAVEL. The hearings will come back to order.

Mr. Ruff, go ahead. We are happy to have you here. We look forward to your testimony.

#### **TESTIMONY OF HOWARD RUFF, RUFF TIMES NEWSLETTER**

Mr. RUFF. Thank you. Even an antigovernment iconoclast like myself is somewhat awed when he comes in direct confrontation with it in the form of these hearings. I consider it an honor to be here. I may be one of the few people testifying on energy who does not have a direct vested interest in the conclusions which are drawn.

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I represent approximately 250,000 people who share my general economic philosophy and read my newsletter, and 1.5 million viewers who view my TV show and come back each week generally because they agree with this point of view which is admittedly a minority point of view, but nevertheless one which I believe is valid.

I am not an oil producer. I own no oil stocks; I never have; I never will. I have stayed out of the stock market and advised my clients to do so in general. But I think I do understand the economy and the economic effect of the proposals that are before the Congress of the United States, as it is my function as a personal financial adviser, an economic writer, to understand the economic environment, what I call the total "economic ecology". Ecology is a description of living things and the environment, and how they interrelate. The economy is an ecology too. You can't mess with one part of it without its having a substantial effect on the other parts of it.

What I hope to do is to help you understand the findings and the long-term impact of the steps which are being proposed by the Government.

In order to do this, I need to lay some background as to what I believe the energy situation is.

There is an energy crisis. A lot of people in this country don't believe there is one, that the whole thing is contrived; but there is an energy crisis. There does not need to be an energy crisis. It is an energy crisis created by Government policy; it has two major effects: One is creating tremendous unwarranted price increases at the gas pumps, to the natural gas consumer and user as well as the petroleum consumer and user. It is also creating an immense transfer of American wealth to the OPEC nations, a transfer of wealth that is beyond any precedent ever-established in the history of mankind.

The only thing that I think comes close to it was the rape of the American continent by the Spanish conquistadores when they took the wealth of the Aztec and the Incas back to Europe.

This transfer of wealth has awesome implications for the entire economic system of the world.

To summarize in advance, the energy crisis is not caused by the energy companies, although I do believe they have taken advantage of it. It is caused by OPEC, although they have also taken advantage of it.

I believe the crisis only needs to be short term if the right steps are taken, not long term. I believe, along with Mr. Pitts, that there are almost infinite resources available to us in this country. I also believe that we can bust the OPEC cartel, but bust it wide open. I also believe that if we do not bust the OPEC cartel that the American dream may well be over, because of the aforementioned transfer of wealth which I will discuss in just a moment.

I also believe we can end the energy crisis in as little as 9 months and in no less than 3 years if the proper steps are taken.

To give you some information and some data that I think support the fact that there need not be an energy crisis, there is a report gathered by the U.S. Institute of Training and Research, U.S. Institute for Applied Systems Analysis, which agrees that oil and gas from conventional sources will last at least until about the time period 2020 to 2030; at least.

The consensus of the report is that increased prices will make it economical to tap new sources and additional petroleum and gas sources will probably be available, although at substantially higher cost, during periods of transition to usable, renewable energy sources, even if the transition period should last 100 years or more.

First: Most of the world, offshore and onshore, has never been systematically explored. Second: The oil industry will be able to get more and more oil and gas out of the ground through technological advancement.

As prices increase, small fields with hard-to-get deposits, that are not economical now, may become worthwhile. More oil will be produced from so-called conventional sources. In other words, there is enough to last us at least the next 100 years, which should be plenty of time for us to make the necessary transitions.

Certain conditions, however, will have to apply in the economy before the transition will be made. More about that in a moment.

As further evidence, Chalmer Kirkbride, engineering consultant to Dr. Henry Lyndon, president of the Institute of Gas Technology in Chicago, said this:

The price of gasoline is so low that there is little incentive to use it efficiently. In the case of natural gas, its artificially cheap price causes consumers to burn it in preference to the burning of coal. This kind of consumption, obviously, at artificially cheap prices, creates shortages.

Dr. Milton Friedman once said:

We may not know how to end inflation but we sure as hell know how to create shortages: merely control the price of anything and it will soon be in short supply.

Mr. Kirkbride also indicated there are 600 trillion cubic feet of gas in the Rocky Mountains that cannot be produced by primary production methods for various reasons. However, there are systems and methods which could make that profitable, which could produce that gas, but the price ceiling, at the time that Mr. Kirkbride made the report, of \$1.42 per cubic foot at the wellhead for natural gas being sold in interstate commerce, is less than the probable cost of producing the gas.

Basically, price controls produce shortages. Price, as any economist should know if he has not forgotten it, is the means by which supply and demand are brought into balance. If the price is too low, then there will be insufficient supply and increased demand.

What is more important, if the price is too low, there is no incentive to come up with alternatives, because the present available energy is simply cheap enough that no one worries about alternatives.

When the price is too low, the gap between the cost of the alternative and the cost of the readily available energy is too great.

For example, much of middleclass America could afford to build solar collectors for their rooftops to heat hot water and also assist in heating their homes. The only problem is that with natural gas and heating oil being so artificially cheap, the gap between the cost of that fuel and the cost of solar collectors is so great that there is no economic incentive. When you are trying to get the country to depend on solar energy you are asking them to fly in the face of their own economic advantage.

The psychology of the marketplace simply says that is like trying to push a string; it does not work. You cannot ask people to act contrary to their own economic advantage except by coercion, and coercion is not the American way.

Now, I have two other comments to make about supply:

The Wall Street Journal reported not too long ago on the MOPPS report, which was called for by the Carter administration in the early days of the administration. This report was commissioned by the Energy Research and Development Administration. It was to determine the availability of natural gas at various prices. "MOPPS" stands for Market Oriented Program and Planning Study. It came in with a prediction if the price of natural gas was allowed to rise to \$3.25 per 1,000 cubic feet, there would be double the reserves we would have at the then proposed ceiling price of \$1.75.

Senator GRAVEL. Who performed that report, again?

Mr. RUFF. It was ERDA and it was called the Market Oriented Program Planning Study, the MOPPS report. The report was embarrassingly optimistic in the face of the "Moral Equivalent Of War" that had been launched to solve our energy problems. So it was sent back to the drawing board; it came back with another estimate which was still too good. They tried a third time. They created a crisis the third time around.

ERDA found 55 years' worth of natural gas at a reasonable price. The MOPPS executive director, Harry Johnson, believes the higher estimate was the correct one. Philip White, MOPPS chairman, said the original estimate might have been a pretty good guess. The Wall Street Journal estimates deregulation of natural gas would bring in so much it would force down the price of its nearest substitute, No. 2 oil, which at that time sold at the equivalent of \$4 a thousand cubic feet, and deregulation of natural gas prices could well break the OPEC cartel because it would sharply reduce the need for new oil.

The problem is that No. 2 fuel oil and natural gas are to a great extent interchangeable in American industry. A ready availability of natural gas, and the opinion on the part of industry that supply would be dependable, would reduce the consumption of petroleum in this country substantially.

There are incredible amounts of available natural gas. There are frontier areas, for example, that are suitable but a long way from pipelines where long-term investment has not been justified by artificially low prices; but at high prices, the pipeline investment would make sense.

It has been estimated that 8,000 feet down on the Texas Gulf Coast there are 105,000 trillion cubic feet of gas. Even if U.S. consumption doubled, we could provide for our Nation's needs for 200 years with 10 percent of the gas in this source alone.

Right now the Government has been subsidizing the import of liquefied natural gas at \$3.25 per 1,000 cubic feet from Indonesia and Algeria, while at the same time controlling the price of natural gas at substantially lower figures than that, just a fraction of that, in this country.

Bill Brown, who is director of technology at the Hudson Institute, a think tank, says, although he does not recommend it as far as fossil reserves are concerned, "There is no doubt in my mind, if we wanted to, we could continue to use energy at the present rate and even increase consumption and export oil in the future."

The only thing preventing us is environmental regulation and uncertain Government policy. There is enough to last us about 600 years at the present annual consumption rate, if we use the recoverable shale oil, and if low-grade oil is included, ten times as much.

The question is not, is there natural gas and oil available, the only question is, at what price?

The Carter administration has proposed deregulating natural gas and oil. That is a step in the right direction; however, the whole thing, in my opinion, has become a most interesting political football.

Not long ago, in 1977, Dr. Vincent E. McKelvey was director of the U.S. Geological Survey. Shortly after the initial Carter energy program was announced, Dr. McKelvey was fired from his position in the U.S. Geological Survey. He was not fired for incompetency. While the original energy program for this administration was proposed, Dr. McKelvey gave a speech in Boston observing that as much as 60,000 to 80,000 trillion cubic feet of gas may be lying in the Gold Coast region, three or four thousand times the amount of natural gas the United States will consume this year. It is an almost incomprehensible large number, that even the bottom range represents about 10 times the energy value of all oil, gas and coal reserves in the United States.

In the same speech, he observed a large amount of oil is still to be found in the United States. Dr. McKelvey was fired; there were all kinds of statements made at the time that it was for other reasons.

Well, I decided I wanted Dr. McKelvey as a guest on my television show. We went to look for him. The last place we expected to find him was working for the U.S. Geological Survey, but we found him working for them in Switzerland. We invited him on my show. He was most reluctant. He said no; he said yes, then no. Finally, he agreed to come, but only if he could speak to me prior to the show.

When he arrived and I sat down to speak with him, I found him to be a very nervous, in fact a very frightened man. He had done a lot of television interviews and speeches, so that wasn't it. The sweat was pouring down his face, literally dripping off his chin. He said, "I will go on your show, but I do not want to discuss my firing or politics." "Why not?" He said, "I have been misquoted. I have never disagreed with the administration. I have never had anything to say that would be in disagreement with present policy." I said, "Fine, but if this event hadn't happened, you would not have been invited on my show. We want to explore it. Don't you want to go on the air and talk to the viewers?"

He said, "Yes," then handed me a copy of a speech which he had delivered subsequent to his firing, which used the same data but drew totally different conclusions. It was a pessimistic report as opposed to the optimistic report.

I believe Dr. McKelvey was a victim of a political firing because his views disagreed with the shortage psychology that was necessary in order to move that legislation through Congress, in the judgment of the administration.

I felt rather sorry for Dr. McKelvey, because I felt he was a man who was just 5 years away from retirement, and he was working in the U.S. Geological Survey, working out his retirement.

Now, how are we going to unlock the natural gas? I believe that the only way to do it is to deregulate now, instantly, immediately, with no windfall profits tax. A phased out deregulation will simply give producers the incentive to hold back for the next level of price increase. In addition to that, the deregulation plan is so complex that there is approximately a 3-year backlog of cases from natural gas producers before the Department of Energy, now waiting for interpretation of the regulations.

It will be long after the regulations have taken effect before the interpretation can be provided, so that they can take the necessary steps. Instant deregulation is necessary. The free market, as I said, seeks by price to bring supply and demand into balance. Price controls limit the supply. If we want conservation, we are going to have to allow the price to rise to the point where conservation becomes a matter of economic survival; then people will do it.

I spent 3 weeks traveling in Europe. Gasoline was \$2 a gallon. This was a year and a half ago. They drive small cars; they ride mopeds. Germany is booming; the economy is even stronger and sounder than ours, \$2 a gallon gasoline is not necessarily a disaster; it certainly is not over there. Price triggers economy and conservation. I don't think you will get it any other way.

As a result, they use 40 percent of the energy per capita that we do and they have every bit as advanced civilization as we have here in America. If we want energy, the price of existing energy sources will have to rise to the point where it is economically feasible, economically practical, and economically desirable to develop these other sources; otherwise, again, you are pushing the string and you are asking people to develop and use sources which cost more than they can develop and get without having to change.

If you want cheaper fuel, you get it also by deregulating, because it will cause a glut which will drive prices down. If you deregulate natural gas and oil, the price will rise abruptly only for a short while, then come back down.

Lifting of price controls eventually will have to work its way in the early stages through much higher prices. It will be politically difficult, particularly in the cold, big cities in the Northeast.

If we would do that, eventually the rising price will trigger additional supplies, will make feasible the development of the alternate energy sources. They will come on stream, reducing the need for the use of fossil fuels at the same time the fossil fuel supply is increasing; and I believe that prices will fall abruptly and the bottom will go out of the traditional fossil fuel and hydrocarbon energy market.

I don't think there is any way to do it except to go cold turkey.

Now, if you deregulate, with no windfall tax, as I indicated, prices will increase, the gap between alternate and conventional supplies will diminish, triggering the development of those supplies; and I think the one thing you have to understand when you look at this from an economist's point of view is that a swing of 5 percent in energy supplies, one way or the other, has an immense impact on price.

I just got back from a week on a houseboat on Lake Powell. If you think you will voluntarily keep people in this country from using gas for their pleasure, I think we have another think coming. We burned 250 gallons of gas exploring the wonders of America. There were powerboats running up and down that lake; no gas shortage at the marinas. It is a very important part of the economy in southern Utah.

We are not going to get economy until energy becomes expensive enough that people decide may be they should cut back a bit.

The windfall profits tax is a proposal by the politically astute to impress the economically ignorant. The average person thinks when you tax an oil company you are taxing a corporation. Corporations don't pay taxes; consumers pay taxes. Corporations merely collect taxes and pass them on. Stockholders pay taxes. Who owns the big oil companies? Hundreds of thousands of small stockholders, the

widows and orphans of America who are depending on those dividends for their retirement, pension funds of America owned by unions, mutual funds of America, college endowment funds whose earnings and investment profits have reduced the cost of higher education.

If we should have a big bulge in profits of the oil companies, that would not scare me one bit. Eventually the discipline of the free marketplace, and particularly the tremendous entrepreneurial strength of the independent oil operators, competing with the big companies, because they will be the most immediate recipients of deregulation, will eventually drive down oil prices.

Those who say that we have to protect the consumer from the corporations of America are in effect saying that the free market no longer works, that the free enterprise system is bankrupt. The disciplines of the marketplace will drive those profits back in line where they should be, even though they may have a bulge temporarily.

Now, the other point I would like to make is that you cannot tax away incentive and increase production. Again, that is the most basic and fundamental of economic laws. It has been proposed that we tax away those profits which are not reinvested. Gentlemen, where then is the reward for the effort, for the venture? They need profits and they need profits to be distributed as dividends.

I am opposed to the windfall profits tax in any way, shape or form, and I don't like the oil companies any better than anybody else likes the oil companies, because, as I indicated earlier in my testimony, I think they have in some instances taken advantage of the energy situation.

I know, from running a relatively small company myself, how hard it is in a large bureaucracy to take instant advantage of anything, but I believe they still might have done so. But I am prepared to accept that relatively minor evil to avoid the major evil of stripping away the incentive of the only people who have the resources and the capital to make the capital investments necessary to solve our energy problems.

The capital required to expand energy production sufficient to meet the demands of this society and to prevent us from going back into the Stone Age is in the hundreds of billions of dollars. Where is it going to come from if they can't accumulate capital? They must be allowed to do so. There is only one place: It has to come from profits. I don't want that money to go into trust funds where it sits there, as the highway trust fund sits there, being unemployed unprofitably in the economy. I believe that the free market is wiser than all of us, and that is where I want the decisions to be made.

Now just to bring this into perspective as to who benefits from what is happening in the energy marketplace, in the 85-cent gallon of gas—and I drew these figures a few weeks ago; they are obsolete now because we no longer have 85-cent gasoline, in California at least—approximately 2½ cents represents profit to the oil companies. Interestingly enough, about 16 cents goes directly into the coffers of some levels of Government. Who is ripping off whom? In the process of arriving at these figures, the concealed and hidden taxes that are paid at every level—the property taxes, the payroll taxes, all of the things that are concealed and they don't even show—it is our estimate that on an 80-cent gallon of gas, the direct and indirect taxes add up to some 33 cents out of the 85 cents. That is a soft figure because there is no way of arriving at it exactly, but it is in the ballpark.

It seems to me that, in the creation of the Department of Energy, we strained at a gnat and swallowed a camel. We are so concerned about oil company profits that I would like to point out to you what we have done simply through the creation of a regulatory system for dealing with the energy crisis:

The Department of Energy in its first year had a budget of some \$10 billion. Well, \$10 billion is a lot of money. To put that in perspective, it represents \$500,000 per Department employee, \$50 for each and every member of the total U.S. population, \$266,287 for each of the wells drilled in the year 1976; \$38.35 for each of the feet drilled in 1976; \$3.59 for each barrel of domestic crude oil production in the country; and I could go on and on. That \$10 billion budget the first year exceeds the total profits of the seven largest oil companies, and that is only the first year's budget.

Now, it seems to me that profits, as they move in the American free enterprise system with its own American stockholders, are not bad; they are good; they get recycled in the system where they belong, rather than put in the unproductive form of trust funds which can only be invested in Government securities and which serve as a ready source of borrowing for the Government to be able to conveniently run additional inflationary deficits.

My major concern, however, which I stated at the beginning and with which I would like to close, is that if we do not increase production in this country sufficient to drive prices back down and bust the OPEC cartel, we will be continuing to drain out of the American economy money at an incredible rate that has, in effect, changed the old saw which you have all heard about the national debt: "We owe it to ourselves." Gentlemen, we no longer owe it to ourselves; 29 to 32 percent of our Treasury bills are owned by OPEC, Switzerland, and German money sources.

Senator GRAVEL. Say that again.

Mr. RUFF. Of our Treasury bills, 29-32 percent are owned by the OPEC nations, the Germans and the Swiss, who are generally acting in behalf of OPEC.

As far as I can tell, about 18 percent of our long-term debt is now owned by those people. Immense amounts of money have been recycled short term to the New York banks and loaned out long term to such creditworthy borrowers as Chile and Zaire and Jamaica and Argentina.

The worst mistake America can make is to borrow short and lend long, but that is what they have done. They have created a vulnerability of the American banking system, economic system that is of epic proportions.

As I said at the beginning of my testimony, the transfer of wealth can only be equalled by the rape of the American continent by the Spanish conquistadores.

To give you an idea of how vulnerable we are, in October of this last year when the dollar was sinking into the Atlantic, the Kuwaitis had \$2 billion in certificates of deposit in the Morgan Guaranty Bank in New York, which came due. They had been rolling over those CD's when they became due because the dollar was sinking so badly and they wanted out, they said, "At this time we want our \$2 billion and we want our other CD's as they become due."

The banks scrambled around in New York for 3 days, trying to find \$2 billion, and they could not find it. Eventually, the Assistant Secretary of the Treasury, being appraised of this situation, brought it to the Carter administration and they made contact with the Germans and various Arab sources, the Japanese, and agreed something had to be done or the entire banking system of the Western World could come down in a domino-type collapse.

The Carter "save the dollar" program, which was effective and worked, was launched suddenly on November 1.

My concern about this is that we have created vulnerability where our foreign policy, our economic policy and our financial policy are being dictated by desert sheiks who are hardly out of the stone age.

In my opinion, this transfer of wealth must stop; it has to cease, and anything that can be done—including allowing the oil companies to have windfall profits to build the capital necessary to end this stupid, unconscionable, immoral and immensely dangerous transfer of wealth, should be done.

Now, if we don't, this Nation will not survive. We have the most productive economy in the world and it is based on energy. We pour 11 calories of energy into the ground for every calorie of fuel we produce—fossil fuels in the form of fertilizer and pesticides and fuel for irrigation and running tractors and farming equipment and transporting food; 11 calories for every 1 we produce.

The food chain begins in the sands of Saudi Arabia right now. I would rather it began on the gulf coast of Louisiana and Texas. Price controls create shortages and lead to corporate policies which take into account shortages and say we have to do something else. So, the energy companies get into shopping centers and takeovers of other companies to diversify away from a potentially dangerous and uncertain future.

Utilities convert to oil because of the uncertain supply of natural gas, exacerbating the shortages.

In my opinion, the key to reducing the shortage of oil is natural gas because that is the abundant source of energy that can carry us for at least—with the most pessimistic of viewpoints—at least 100 years, as much as 600 years. It is ecologically pure; it burns clean. I believe that natural gas is what will bridge the gap; but we must allow those prices to rise.

Again, to summarize, we must lift prices now. We must not tax away the profits. We must reward the producers and allow them to accumulate the investment capital. If we don't, it will only give them incentive to delay for the next lifting. We must get them out of this morass in which they are bogged down in this jury-rigged, Rube Goldberg deregulation scheme that the Department of Energy is trying to administer.

An uncertain price structure means an uncertain supply picture.

Gentlemen, I appreciate the opportunity to be here, primarily because I believe that this is the most important issue before the Nation today. It has moved slightly ahead in my scale of demons, ahead of the inflation monster that is about to devour us, that is part of us. We cannot allow the machinery of the Western World to grind to a halt. We cannot allow our wealth to be transferred into the hands of a small group of autocratic, stone age rulers. Thank you.



Senator GRAVEL. Thank you very much, Mr. Ruff.

I have two brief questions: One, you alluded to at the end, that the reason Government remains timid on deregulation is fear of inflation. I wonder if you might speak to that problem, why you think a cold turkey approach is necessary, which many consider inflationary because prices would rise as a result of a cold turkey approach?

Mr. RUFF. I think the problem lies in the definition of "inflation." If you define inflation as rising prices, which most people do, you are right, it would be inflationary,

But inflation is not rising prices. Rising prices are a symptom of inflation. Things other than basic inflation can cause rising prices as contradictory as that might seem.

Inflation is always, at all times, in all places, a monetary phenomenon caused by an increase in money supply. Other things can cause prices of individual commodities to rise and fall; that is not inflation; that is a temporary market phenomenon of fluctuating prices.

The underlying and fundamental cause of inflation is the monetary policy on the part of Government, the creation of deficits on the part of Government as well as the immense expansion of the money supply based on consumers wishing to expand their standard of living without increasing their productivity so they borrow, and money is created out of nothing in the banking system.

That money is spent into circulation and, in effect, drives up prices.

If we deregulate prices, there is no question that the price inflation rate, which I distinguish from true monetary inflation, could rise. It could add as much as a point and a half to the price inflation rate. I believe that is a very small price to pay for the long-range benefits down the road.

Now, the analogy that I might use is drug addiction, a subject with which I am familiar, having had some friends who were caught up in this. When a man has a \$100-a-day habit, there is no way to cure it except to go cold turkey. He has to be willing to be sick for a while in order to get well. When the situation has a certain momentum in the other direction, you don't stop it on a dime and turn it around. My opinion is that the increase in inflation rate of as much as 1½ points is tolerable when you compare it to the alternative. The alternative is a long-term, almost infinite increase in energy prices unless we increase the supply.

I am willing to trade off 1½ points for 1 year, 1½ years, or 2 years in order to create an abundance that will drive those prices back down.

You are dealing with a market price phenomenon, not an underlying, fundamental inflation phenomenon. They are two different matters although they reflect themselves with the same thermometer of rising prices.

My opinion is that the long-term benefits will outweigh the increase in the short-term inflation rate.

Senator GRAVEL. You made a statement earlier that we could move from the scarcity that we have to an abundance in a period of 18 months to 3 years. What do you have to back that up?

Mr. RUFF. Because it would take about that long, if we had instant deregulation, to have so many oil wells and gas wells in this country producing such a large supply that we would have an abundance which would drive prices down.

We went in a period of a few months, from an oil glut to an oil shortage. It was only about 8 months ago, 9 months ago, I believe, that oil could be bought in the international market below the posted OPEC prices. This is a relatively rapid moving phenomenon. I believe that the increased production that could be brought on line in that period, with the market discounting the future—you see, the market does not just say, here is the supply now; it looks at the trends—prices rise or fall based on expectation of future prices also.

I watch the futures market, for example. A September contract in wheat reflects the expectations of the future and has an effect on current prices.

My opinion is that the market system will take about 18 months to work through the economy as the supply figures begin to reflect the increases in production.

Senator GRAVEL. Senator Wallop?

Senator WALLOP. Thank you, Mr. Chairman.

With regard to those supplies—and I don't doubt that there may be a justification for the optimism—but what happens to the refining capacity of the country, what is likely to get that capacity on line in 18 months?

Mr. RUFF. One of the reasons why I think natural gas is a key is because refining capacity is not a problem with natural gas. The key is to get natural gas in the system and get those corporations that are now burning fuel oil to burn natural gas.

It would take considerably longer than that to increase the refinery capacity. Natural gas is the key. That is the bridge, the wedge, and eventually the refining capacity would be increased to deal with the oil problem.

Senator WALLOP. You mentioned something that I have read in other places, the instability and the unreliability created by price regulations and distribution regulations of natural gas taking many utilities out of the natural gas business and into oil.

That is also true, I think, of some major industrial users of gas, is it not?

Mr. RUFF. That is precisely true. It is not so much price; it is uncertainty of supply.

Senator WALLOP. I understand that.

Mr. RUFF. The uncertainty of supply is based on the regulatory morass.

Senator WALLOP. The price side of the argument is clearly demonstrated by the fact that the old intrastate market was higher than interstate in many instances.

Mr. RUFF. Now, that Texas situation is very interesting. Those prices went higher than they should have. There was a lot of criticism of the natural gas producers, that they were in effect taking advantage because they had a free market. Those arguments had been used by the people who said if we deregulate, look what happened to Texas. The problem is that the Texans had the choice of selling in the interstate market at 42 cents a thousand cubic feet, which was so low that they were literally losing money on it. They had to make it somewhere, so they made it up with the poor Texans. If it were deregulated nationally, and the cost of production and profit was spread throughout the country, in effect, no one area, being the only deregulated area available to them, would have to bear that whole burden.

Senator WALLOP. I think a pipeline would make a considerable difference in the price of natural gas products.

Mr. RUFF. No question about it.

Senator WALLOP. I read someplace that between 74 and 78 percent average of industrial energy users of oil, distillate oil, industrial oil, went from 21 to somewhere in the neighborhood of 27 percent. Is that still rising?

Mr. RUFF. Yes. I do not know what the figure is, but that trend is still intact.

Senator WALLOP. Thank you.

Senator GRAVEL. Senator Boren?

Senator BOREN. Mr. Chairman, I certainly want to commend Mr. Ruff for his statement. I think it makes much good sense.

I was glad to hear you resurrect the MOPPS report again.

As I understand it, the first two reports really have never been fully made public?

Mr. RUFF. We have been trying to get a copy of it under the Freedom of Information Act. So far we have not been able to get it. We are still working on it.

Senator BOREN. Do you have any idea as to what caused the radical change in the figures? What constraints were put on the economic models between the first two reports, which showed substantial increased production as a result of price increase, and the third report, which showed virtually no increase in production?

Mr. RUFF. I believe, not having seen the first two, that what happened is similar to what happened in the two McKelvey speeches I talked about earlier. He used the same data in terms of supply availability in each speech, but in the second speech, which was pessimistic, after his personal holocaust, there was a slight alteration in the percentage of increase of usage.

The population figures were altered slightly. Just a slight fraction of a percent in terms of the compounding growth of energy use will knock a few hundred years off the supply. In other words, by merely altering the consumption assumptions—does that make sense, the consumption assumption?—the number of years that it would last was substantially altered because there was no real dispute over the amount available.

Also, they monkeyed around a bit with the cost of developing the natural gas.

Senator BOREN. I understand also that the rig count was assumed in the third report; I think the constraint was put on the economic model that once you reached \$1.75 that all the rigs would be busy, and they put in an assumption that no more rigs could be built. Therefore, there could be a very slow or minimal response in terms of additional production. That is one of the constraints we found. So that we get a graph showing price increases on one axis and production levels on the other. You have a general slope and then all of a sudden you have a square corner on the graph. They assumed that if price went up like \$10; there would be virtually no increased production.

Mr. RUFF. I have heard that also. I think the one thing we must remember is that we must never underestimate the entrepreneurial instincts of the independent oil and gas operators in this country. If there is money to be made, they will punch a hole somewhere.

The thing that is distressing to me is that a \$3.25 per 1,000 cubic feet, which is the basic price assumption we have to make for those kinds of supplies available, it is still cheaper on a cost per Btu basis than what we were paying the Arabs for oil, converting to No. 2 heating oil, before this recent round of tremendous increases. In other words, even at those prices, it is a less expensive form of fuel and, I stress that point, to which a significant number of American industries can convert.

Senator BOREN. Do you have any idea why the rig count has behaved as it has? From 1976 to 1978 we had roughly an increase of something like 300 in the rig count, and since the Natural Gas Act has gone into effect we have had a decline over the next 12-month period to something like 250 in the rig count.

Mr. RUFF. I can only speculate. My speculation is, that act is so confusing and has created so much need for interpretation in individual circumstances that they are bogged down in the regulatory morass again at DOE.

Senator BOREN. Plus the possibility that there could be almost penal action taken against them in terms of this \$5,000 fine per day, if the price were later found to be incorrect?

Mr. RUFF. I find it very difficult to obey a law I don't understand. If I am afraid I will violate a law I don't understand, I tend to become inactive. I will do nothing.

Gentlemen, I think that what we did in creating a \$10 billion a year bureaucracy—at least, if it had grown from \$1 billion a year, it would have developed a system that functioned somewhat in that evolutionary process. It is like creating a human being at the age of 20 without going through the maturation process.

The governmental agencies growing from small beginnings have enough trouble creating anything right.

Ruff's first law of government is that government is dumb, and the second one is that, when government solves a problem, it creates two or more problems of equal or greater dimensions. I think that is what has happened. The Department of Energy is now one of the great enemies of the American people, inadvertently, with the best of intentions.

Senator BOREN. I have listened with great interest as you talked about the possibility that the American people are going to be asked to pay substantially higher energy prices. By the way, these increases are coming before the decontrol of oil has had time to have any effect. I think this shows what caused the price increases of great magnitude. It is not decontrol.

What really seems to be happening is that more and more of the cost that the American consumer is having to pay is being funneled into the cost of government. With the windfall profits tax, the higher we raise the rate of tax—as one proposal said, raise it to 85 percent—it seems to me we are setting the stage for the ultimate ripoff of the consumer through high taxes. We would be saying to the consumer, "Pay higher prices but get no more energy in return for it."

If we take all the money that flows from the higher price being paid by the consumer and hand it over to the Government, the consumer gets nothing for higher prices but higher taxes, which produce absolutely no more energy.

Why is it that we cannot seem to adequately alert the consumer to the fact that he is being set up for the biggest ripoff in the history of this country in terms of the Government capturing the higher prices which he is being asked to pay and put them into higher taxes?

Mr. RUFF. It is the nature of taxation; it is the nature of government, when it wishes to tax, to conceal the nature of the tax. Corporate taxes are the most efficient form of concealed tax. I am disturbed in the broader context of the general antibusiness rhetoric that we have been hearing from the current administration, not just oil companies. For example, in the first quarter of this year when the last quarter's profit picture was reported, it was called a disaster, "unconscionable profits," and so forth, which creates an antibusiness climate which makes it very convenient and most politically feasible to place higher taxes on business or industry, creating a climate where the public, not understanding the nature of corporate taxation, will go along with it.

I circulate among my friends just like everybody else does. When the subject of energy shortages come up, there is suspicion of a conspiracy, there is an anticorporate feeling in this country, an antiprofit feeling, that disturbs me greatly.

The free enterprise system is a terrible system until you compare it with any others. There is no perfect system known to man short of the Kingdom of God, and I don't think that is just around the corner for the moment. Consequently, we have to live with the one we have.

The free enterprise system does create inequities. Generally speaking, it creates more wealth, more prosperity for more people than any system in the history of the world. That whole system depends on two things: One, profits to be distributed to the stockholders and reinvested; and, two, the creation of pools of capital.

The evil that we are dealing with here is taxation, stripping away profits, a great threat.

This is an immense precedent. I am worried about it as a precedent, as much as an individual, isolated act to tax away these profits. But also inflation, combined with this, eating away at the purchasing power of the average American saver faster than he can earn interest on his savings, creates an immense disincentive to save. So, the pools of capital that might have been available to borrow to develop energy sources, to build natural gas pipelines in Alaska, these pools of capital have not been accumulated, simply because the average saver, when he sits down and figures out a 9.5-percent return on a CD at the bank, when his money is losing purchasing power at the present rate of 13 to 14 percent, knows this is no way to get rich.

So, the disincentive to save, to accumulate capital in that direction, means it has to come from somewhere. If you are going to inflate, and this Government is inflating, and you are going to destroy the incentive to accumulate capital, it has to come out of profits.

We have a dual tax on the two sources of capital in this country, profit and savings. Corporate taxation, especially this kind of vicious windfall profits tax, is going to destroy the other source. Where is capital going to come from to develop the energy necessary to avoid this incredible transfer of wealth from this country?

Senator BOREN. Thank you.

Senator GRAVEL. Senator Baucus?

Senator BAUCUS. Thank you, Mr. Chairman.

Mr. Ruff, I take it you are opposed to the windfall profits tax?

Mr. RUFF. I believe on balance you might say that, sir.

Senator BAUCUS. Are you opposed to it in its entirety, or would you modify the tax rate down as it has been passed out of the Ways and Means Committee?

Mr. RUFF. I am opposed to a windfall profits tax at all. I am opposed to it on philosophical grounds and practical grounds.

Senator BAUCUS. I take it your view is, there is sufficient oil and gas to be found and, with decontrol and with no windfall profits tax, enough capital will be amassed and enough wells drilled so that we can assure ourselves of a sufficient supply?

Mr. RUFF. Literally hundreds of years, sir, at reasonable prices.

Senator BAUCUS. What are reasonable prices? That is a tough question, I realize.

Mr. RUFF. Cheaper than we are now paying on a cost-per-Btu basis for OPEC oil.

Senator BAUCUS. Do you think that, through the years, through the next two centuries, with complete decontrol and no additional taxes imposed on the oil companies and energy companies, we can continue without a recession the present mix of energy production of petroleum products, fossil fuels, coal, nuclear, et cetera, and that there will be virtually no change in the world economy?

Mr. RUFF. No. That was not my point. I believe my testimony, before you came in, was that the rising prices would stimulate the production of oil and natural gas. In other words, it would narrow the gap between the cost of conventional sources and the development of solar collectors and various alternatives that have been proposed, conversion of seawater into hydrogen, or converting hydrogen gas into safe liquid hydrides to be burned in slightly modified automobiles; but it is expensive. The increase in the price of fossil fuel, allowing the marketplace to seek its own level, bringing its supply and demand in balance would also narrow the gap between fossil fuels, hydrocarbon fuels, the traditional sources, and alternate sources, and will stimulate investment in that area by the economic incentive of the potential for profit.

I am saying that the equation would be altered. As far as avoiding recession is concerned, again, that is like asking if the junkie can get well without undergoing withdrawal symptoms.

I believe we have to risk recession. In fact, I think we are in the early stages of one right now. We spent the first 6 months of the last recession arguing whether we were in one. We are doing the same thing now.

I believe we cannot avoid a recession, but for other reasons than energy. In fact, I believe we are flirting with depression, because of inflation, but that is a totally separate matter.

I believe that die has been cast. We might alter the timing of it, or depth of it. My opinion is that there is no other way to go cold turkey without withdrawal symptoms. We have gone too far down the road. We have gone into a blind canyon now.

Senator BAUCUS. You don't agree with those who advocate some kind of Manhattan project approach to find some solution to the alternate sources?

**Mr. RUFF.** No. The last real productive partnership between government and industry was a project to put a man on the moon. If you look at that whole 10-year episode, free enterprise was really unleashed to do the job. The Government spent money, yes, but really nowhere near the amounts of money that we are talking about here. That has to come from private industry, in my opinion.

If we could go back to wartime dedication, a simpler world where the bureaucratic and regulatory apparatus had not grown to the point of clumsy inefficiency, if we were willing to put this thing in the hands of scientists and free enterprise and simply provide the funds and stand aside and let them do it and make money while they did it, that might work. But I think it is impractical in today's environment, especially given the distrust and the anticorporate profit feeling that there is in the country, particularly directed toward the oil companies.

Remember, it was not the Government that really did the job. It was the private industry that did the Manhattan Project.

**Senator BAUCUS.** Your basic feeling is that, with decontrol and no windfall profit tax, additional profits of capital will be plowed back into energy production?

**Mr. RUFF.** Not just that, sir, but that there would also be profits distributed to the stockholders, which provides the incentive to do the job. The assumption I have seen in most of the debate and most of the news reports I have had on the windfall profits tax is whether or not the profit would be plowed back into production. I have made a lot of money in my lifetime, for myself and my clients, by betting on human nature.

If there are profits to be made, somebody will spend the money to do the job. If we tax away the profits and say, "We will let you keep the profits to reinvest," that is basically saying, "If you will pour everything back and not sample any of the rewards as you go along, we will let you do the job." That is not sufficient to get the job done.

**Senator BAUCUS.** Why are such profits going not into energy but in the circuses and Montgomery Wards, et cetera?

**Mr. RUFF.** I say that the incentive to put money into circuses or into acquiring Montgomery Ward or building shopping centers would diminish. The reason these companies are doing that is because of the uncertainty of their energy profits based on the present attitude and political climate of government toward energy. I say if that climate were changed and they could see their way clear, they would do what they do best, and they would not need the carrot or the stick.

**Senator BAUCUS.** You would not use the carrot or stick in terms of legislation?

**Mr. RUFF.** This present legislation that is being considered now, in my opinion, is the wrong carrot and the wrong stick.

**Senator BAUCUS.** Apart from this stick or carrot, what would you suggest?

**Mr. RUFF.** I really come back to my fundamentals. I believe that if the financial incentive is there to get the job done with energy—all the conditions are right for anybody in his right mind, who knows the business, to want to invest in the energy field. That is where the action is, where the need is, where the shortages are. Energy is not a fad that will go away sometime down the road. If they know they can see their way clear for the long-term future for profitability, I don't think they have to worry what they will do with their money.

Senator BAUCUS. Some Americans, probably the majority, are concerned about the size of the majors. We did, at the end of the previous century and the early part of this century, enact antitrust laws. We were concerned about the size of the largest companies in this country.

Frankly, I personally subscribe to that portion of the public policy which tries to encourage free competition; that is, to discourage excessive bigness. Are you concerned, either through decontrol and no wind-fall profits or through any other conditions that might be enacted legislatively or not, with size at all? I heard you 15 or 20 minutes ago speak eloquently about free competition, saying there is nothing worse, but there is nothing better. I am curious whether you think we should repeal the antitrust laws, or should we be at all concerned with bigness?

Mr. RUFF. I don't think we should repeal the antitrust laws.

Senator BAUCUS. Excuse me. More money would be going to the major companies. Is that a concern?

Mr. RUFF. I don't share your concern about size. The oil and energy industry is as competitive as any industry in the world. It is competitive in exploration, it is competitive in marketing. If it were not competitive, I don't think you would see the kinds of advertising budgets that you see to have you choose Standard over Mobil. I believe that, as long as the independent producers of this country are as entrepreneurial as they are, producing as large a percentage of the energy industry as they do, they are in a position to make sure that market prices cannot be dictated by the majors.

The gas and oil industry, as far as I can tell, is as cutthroat a business as any in the world. Where the majors have been able to mandate or dictate prices through their economic powers has been, generally, in a regulatory climate. We all know how regulated industry fights to keep regulation because it creates an environment within which they can function. The trucking industry does not want to be deregulated. The airline industry fought deregulation. In my opinion, size is not the problem. Government regulation has given many industries, including the oil industry, chances to take advantage of situations that it could not take advantage of otherwise.

I believe the assault on size is a dangerous philosophy.

Senator BAUCUS. What if Exxon were to triple in size and the other bottom five of the seven sisters were all acquired by Exxon. Would size then be a problem for you or not?

Mr. RUFF. Yes, but that is a theoretical world that has no relation to the real world. Exxon is not going to triple in size.

An argument about size based on the theoretical and impossible tripling of Exxon, in my opinion, has no validity because that is not the real world. It is not going to happen.

Senator BAUCUS. Some think it might.

Thank you, Mr. Chairman.

Senator GRAVEL. Thank you, Mr. Ruff. for your fine testimony.

Mr. RUFF. Thank you.

Senator GRAVEL. Our next witness is Mr. Rudy Oswald, director of AFL-CIO research department.

We appreciate your being here, Mr. Oswald. You may proceed as you feel most comfortable.



**STATEMENT OF RUDY OSWALD, AFL-CIO RESEARCH DEPARTMENT,  
ACCOMPANIED BY STEPHAN KOPLAN, LEGISLATIVE REPRESENTATIVE AND ARNOLD CANTOR, ASSISTANT DIRECTOR OF RESEARCH**

Mr. OSWALD. Thank you Mr. Chairman. I have with me Stephen Koplan, legislative representative, and Arnold Cantor, assistant director of research for the AFL-CIO.

We appreciate this opportunity to present the AFL-CIO's views on windfall profits taxes.

The AFL-CIO had advocated and supported tax measures to curb profiteering on many occasions. Today, with rapid price increases and repeated calls for sacrifices on the part of the great majority of Americans, it is imperative that effective steps be taken to prevent a privileged few from reaping huge benefits.

Therefore, in order to achieve maximum benefits to inflation-hit Americans, the AFL-CIO recommends Congress:

First: Recontrol the price of oil.

Second: Impose a tax on the profits—"windfall" or otherwise—of all businesses when they exceed a reasonable profit margin. This was one of the AFL-CIO's recommendations when the AFL-CIO executive council presented its views on the administration's wage-price control program.

We, therefore, are in favor of taxing the windfall profits of oil companies or for that matter, any other group that benefits from the hardship of others.

Unfortunately, the administration proposal is tied to decontrol and we maintain that decontrol is unwarranted. On May 8, 1979, the AFL-CIO executive council unanimously adopted a statement opposing oil decontrol. The council stated:

At a time when the administration professes to be fighting inflation—at least by holding wages to 7 percent—there is no justification for sanctioning exorbitant oil price increases that will further pad bloated oil company profits.

The council urged maximum support be given to efforts to "reverse the President's decision to decontrol oil prices and maintain the current system of oil price control."

Last month before the House, we outlined the weaknesses in the administration's windfall tax proposals and we were pleased that the House Ways and Means Committee recognized many of these weaknesses and strengthened the administration's proposal by raising the tax rate to 70 percent and broadening its coverage.

And the committee bill slowed down the phaseout of the tax. The Ways and Means bill, however, trimmed an already modest tax proposal of the administration on newly discovered oil. On the whole, the committee's bill did amount to a significant improvement but does not go far enough.

The AFL-CIO has endorsed a much stronger measure—H. R. 4272. That proposal, for an 85-percent tax on the price of oil that exceeds existing controls, is reasonable and we urge this subcommittee to consider that measure and recommend it to the full committee. The proposal also calls for an historical tax decline curve of approximately 1 percent for lower tier "old" oil.

This would allow for a reduction of old oil subject to the windfall tax in line with actual experience and would in turn result in a greater capture of the windfall profit than that proposed by the administration and the Ways and Means Committee. Moreover, the administration and the Ways and Means Committee called for January 1, 1980 as the effective date for the windfall profits tax—but “decontrol” went into effect June 1, 1979. At minimum, the windfall tax should be effective June 1, 1979.

The attached table 1 based on the data released by the administration when their proposal was presented clearly, in our view, demonstrates the need to meet the issue of windfall profits through prevention as well as symptomatic relief—continued controls and an effective tax measure.

The table shows, for example, over the 7-year 1979–85 period, consumers would be paying a total of \$86.2 billion more for oil as a result of decontrol and the administration’s windfall profits’ tax would recoup only \$7 billion—8.1 percent. The Ways and Means bill would add roughly \$6 billion to the administration’s proposal.

We have also attached two other tables (2 and 3) which highlight the profit performance of the Nation’s oil giants over the past 6 years—a period in which most of the world suffered recession and rampant inflation while oil rich nations and huge oil companies prospered.

Table 2 shows, for example, that during the deep recession years of 1974–75—when the price of oil quadrupled—the 21 major oil companies’ after tax profits averaged 87 percent above the prerecession, preembargo levels of 1972. In contrast for all U.S. corporations, according to the Commerce Department, net after tax profits during 1974–75 averaged 23 percent below 1972 levels.

Rates of return on equity also demonstrates the impact of price hikes on oil company treasuries. The 21 “majors” rates of return during 1974–75 were, respectively, 16.5 percent and 21.1 percent—a 2-year average of 18.8 percent. For all other corporations, the average during those 2 years was 12.8 percent.

During the first quarter of 1979 when gasoline prices were rising at a 36.3-percent annual rate, oil company profits and rates of return skyrocketed once again. Profits of Conoco were up 343 percent; Standard Oil of Ohio, up 303 percent; Amerada Hess, up 279 percent and Occidental up 174 percent.

In the first quarter of 1979, Standard Oil of Ohio and Amerada Hess had a 33-percent annualized rate of return on equity, Marathon 29 percent, Continental and Phillips 20 percent, Mobile 19.6 percent, and Standard of Indiana 19.5 percent. (See table 3.)

Similarly, the attached table 4 demonstrates in our view the fact that oil companies’ huge profits have been used to finance ventures that had nothing to do with increasing this Nation’s energy supplies and have used their money to buy Montgomery Ward, Anaconda Copper and other such ventures unrelated to oil.

Mr. Chairman, the AFL-CIO is convinced that the Nation’s energy problem is a critical one. Adequate supplies, reasonable prices and reliable sources are fundamental to the economic health of the Nation.

While prices of gasoline, heating oil, and other energy costs have risen dramatically, these costs would have risen to even higher levels without controls in the past decade.

It was monopoly power that allowed them to do that and we need to continue to maintain price controls over such monopolies.

Our information indicates that 83 percent of refineries' production is now controlled by the 20 top corporations. We don't believe that price for oil should be set by OPEC sheiks but rather than they should be treated as a utility and come under the control of the Government of the United States.

The AFL-CIO is convinced there is no valid reason to discontinue controls.

Senator GRAVEL. At this point I will have to take a short recess to go vote. I will be right back.

[A brief recess was taken.]

Senator GRAVEL. The committee will be in order.

Please proceed.

Mr. OSWALD. We also caution that an economic policy based on the belief that Americans must be punished at the pump and in their furnace in order to reduce consumption ignores the fact that consumers will suffer a direct \$86 billion cost and a ripple impact of an equal amount on their shelter, food, clothing and life-supporting needs over the next 7 years.

Within the context of the tax proposals now before the Congress, we urge that a strengthened and broadened windfall profits tax along the lines of H.R. 4262 be approved. But again we emphasize that the AFL-CIO still remains opposed to decontrol and insists on across-the-board anti-inflation measures which will equitably and effectively control the price of everything and the income of everybody—including an excess profits tax.

Senator GRAVEL. Is that essentially a policy statement involving wage and price controls in the whole economy?

Mr. OSWALD. Yes, Senator. That statement was adopted by the AFL-CIO executive council last October. I will be happy to make a copy available for you.

Senator GRAVEL. Would you, please.

Finally, since this subcommittee has expressed interest in overall energy considerations, we have attached a comprehensive statement adopted by the AFL-CIO executive council last February on energy prices and supplies. The statement outlines the AFL-CIO's position on programs to develop domestic supplies and alternative sources; conserve energy resources and meet immediate needs for dealing with shortages.

[Tables and other materials previously referred to for the record follow:]

TABLE 1.—IMPACT OF DECONTROL AND WINDFALL PROFITS TAX ON OIL COMPANY REVENUE AND PROFITS

[Dollar amounts in millions]

Year	Increase in oil company revenues due to decontrol	Net increase in after tax income due to decontrol excluding windfall tax <sup>1</sup>	Increase in tax burden due to windfall profits tax <sup>2</sup>	Increase in net income after windfall profits tax (2)-(3)	Effective windfall profits tax rate on after tax income (per cent) (3)+(2)	Effective windfall profits tax rate on added revenues (percent) (3)+(1)
1979.....	\$1,208	\$499	0	\$499	0	0
1980.....	5,797	2,421	\$479	1,942	19.8	8.3
1981.....	11,503	4,496	1,529	2,967	34.0	13.3
1982.....	14,488	5,255	1,742	3,513	33.0	12.0
1983.....	15,119	5,068	1,244	3,824	24.5	8.2
1984.....	17,657	5,009	1,075	3,933	21.5	6.1
1985.....	20,375	4,973	927	4,046	18.6	4.6
Total, 7 yr.....	86,147	27,721	6,997	20,724	25.2	8.1

<sup>1</sup> Increase in oil company revenue minus expenses and Federal income tax.<sup>2</sup> Net effect of windfall profits tax after accounting for deduction for Federal income tax purposes.

Note: Over the 7-yr period, decontrol without windfall profits tax, according to administration estimates, would increase oil companies' revenues by \$86,200,000,000 and after tax profits by \$27,700,000,000. Applying the windfall tax reduces decontrol profits by only \$7,000,000,000, down to \$20,700,000,000, an effective rate of 25.2 percent on profits and 8.1 percent on total receipts.

Source: Based on data presented by Department of Treasury in Apr. 26, 1979, Carter message.

TABLE 2.—NET INCOME AFTER TAX AND THE RATE OF RETURN OF EQUITY OF SELECTED OIL COMPANIES

[Dollar amounts in millions]

Company	1978		1977		1976		1975		1974		1973		1972	
	Net income	Per-cent return	Net income	Per-cent return	Net income	Per-cent return	Net income	Per-cent return	Net income	Per-cent return	Net income	Per-cent return	Net income	Per-cent return
Total.....	\$12,930.8	13.8	\$11,754.4	14.4	\$11,257.3	15.5	\$9,467.8	21.1	\$12,585.4	16.5	\$9,209.3	14.2	\$5,914.1	9.1
Amerada Hess Corp.....	142.4	10.2	179.0	25.5	53.0	30.4	128.4	12.3	201.9	21.4	245.8	31.8	46.2	8.3
Ashland Oil Corp.....	245.0	27.0	245.0	21.1	164.0	21.8	119.4	16.5	113.0	17.1	85.2	15.5	68.0	13.5
Atlantic-Richfield.....	804.3	14.6	702.0	17.9	575.0	18.3	350.4	9.6	474.6	13.7	270.2	8.7	192.5	6.5
Cities Service Co.....	118.0	6.0	210.0	11.2	217.0	12.6	137.7	8.4	203.8	12.2	135.7	3.4	99.1	6.9
Clark Oil & Refining Corp.....	16.0	13.1	14.3	12.8	9.4	9.1	5.2	5.3	7.1	7.2	30.5	27.9	8.3	9.8
Continental Oil Co.....	451.3	14.3	381.0	13.9	460.0	19.0	330.9	15.5	327.6	15.9	242.7	13.4	170.2	10.4
Exxon Corp.....	2,763.0	13.7	2,423.0	12.8	2,641.0	14.9	2,503.0	14.7	3,142.2	20.0	2,443.3	18.5	1,531.8	12.5
Getty Oil Corp.....	327.6	11.1	328.0	12.9	258.0	12.8	256.7	13.5	281.0	15.3	135.0	8.8	76.1	5.2
Gulf Oil Corp.....	791.0	10.2	752.0	10.5	816.0	12.2	700.0	10.9	1,065.0	17.9	800.0	14.4	447.0	8.3
Kerr-McGee Corp.....	118.0	11.3	119.0	12.4	134.0	15.6	131.0	17.7	116.0	19.2	62.8	11.2	50.6	10.1
Marathon Oil Co.....	225.2	15.6	197.0	16.1	196.0	18.1	128.1	12.7	170.5	17.1	129.4	14.6	79.8	10.2
Mobil Oil Corp.....	1,125.6	12.6	1,005.0	12.6	943.0	12.8	809.9	11.8	1,047.5	16.3	849.3	14.9	574.2	10.9
Murphy Oil Corp.....	46.6	10.3	47.1	11.9	48.9	13.6	40.1	12.4	66.6	23.5	48.5	20.2	14.3	7.6
Phillips Petroleum Co.....	710.5	19.5	517.0	17.8	412.0	16.0	342.6	14.1	429.8	18.9	230.4	11.7	148.4	8.1
Shell Oil Co.....	813.6	13.3	735.0	14.7	706.0	16.4	514.8	13.2	620.5	17.4	332.7	10.7	260.5	8.9
Standard Oil of California.....	1,105.9	13.4	1,016.0	13.9	880.0	13.0	772.5	11.9	970.0	15.0	843.6	14.5	547.1	10.5
Standard Oil Co. (Indiana).....	1,076.4	15.1	1,076.0	15.5	1,012.0	15.7	787.0	14.1	970.3	18.9	511.2	12.4	374.7	10.0
Standard Oil Co. (Ohio).....	450.2	22.1	181.0	10.1	137.0	9.1	126.6	8.7	125.9	10.1	74.1	6.5	59.7	5.6
Sun Oil Co.....	365.4	12.4	362.0	14.8	356.0	19.4	220.1	9.2	377.7	16.3	229.7	12.4	154.7	8.8
Texaco, Inc.....	852.5	9.0	931.0	10.1	870.0	9.8	830.6	9.6	1,586.4	17.6	1,292.4	16.2	889.0	12.4
Union Oil of California.....	382.3	14.4	334.0	14.6	269.0	14.3	232.8	12.1	288.0	15.0	180.2	10.5	121.9	7.6

Source: Standard and Poors' industrial survey.

TABLE 3.—AFTER-TAX PROFITS AND RATES OF RETURN ON STOCKHOLDERS' EQUITY, MAJOR OIL COMPANIES, 1ST QUARTER 1979

[In percent]

	Increase in net income after tax, 1st quarter 1979 compared to 1st quarter 1978	Annualized rate of return on equity
Exxon.....	37	18.0
Standard Oil of Ohio.....	303	33.0
Standard Oil of California.....	43	17.0
Standard Oil of Indiana.....	28	19.5
Phillips.....	4	20.0
Marathon.....	108	29.0
Mobil.....	81	19.6
Continental.....	343	20.0
Amerada Hess.....	279	33.0
Sun Oil.....	43	16.0
Cities Service.....	42	16.0
Getty.....	42	14.6
Gulf.....	61	13.0
Shell.....	16	14.7
Texaco.....	81	13.0
Atlantic Richfield.....	61	NA
Occidental.....	174	NA

NA = Not available.

Source: Available company quarterly reports.

TABLE IV.—HOW U.S. OIL COMPANIES ARE MAKING NONENERGY ACQUISITIONS

Company	Acquisition (year)	Business
Exxon.....	Compania Minera Disputada (Chile) (1977) <sup>1</sup>	Copper mining.
Texaco.....	Jefferson Chemical (Britain) (1974) <sup>1</sup>	Veterinary chemicals.
	Jefferson Chemical (Canada) (1974) <sup>1</sup>	Chemical marketing.
Mobil.....	Marcor (1976) <sup>1</sup>	Merchandising, packaging.
Gulf.....	Kewanee Industries (1978) <sup>1</sup>	Chemicals.
Standard Oil (Indiana).....	Analog Devices (1977) <sup>1</sup>	Components for data acquisition.
	Cetus (1977) <sup>1,2</sup>	Microbiology.
Atlantic Richfield.....	Sinclair-Koppers (1974)	Plastics, dyes.
	The Observer (Britain) (1976) <sup>1</sup>	British newspaper.
	Anaconda (1977) <sup>1</sup>	Nonferrous metals.
	Continental Cables & Conduits (1977)	Electrical conduits.
	I/C Engineering (1977) <sup>1</sup>	Process control.
	Solar Technology International (1977) <sup>1</sup>	Photovoltaic cells.
Shell.....	Polymer Division of Witco Chemical (1977)	Plastics.
Tenneco.....	Starla-Werken (Sweden) (1974) <sup>1</sup>	Automotive exhaust systems.
	ETS.R. Bellanger (France) (1976) <sup>1</sup>	Do.
	Harmo Industries (Britain) (1976)	Automotive parts.
	International Foam Division of Holiday Inns (1976) <sup>1</sup>	Flexible polyurethane foam.
	L. D. Properties (1977) <sup>1</sup>	Almond orchards.
	Monroe Auto Equipment (1977)	Hydraulic shock absorbers.
	Philadelphia Life Insurance (1978)	Insurance.
Sun.....	H. P. International (1975)	Industrial distribution.
	St. Johnsbury Trucking (1975) <sup>1</sup>	Trucking.
	Audio Magnetics (1976) <sup>1</sup>	Tape cassettes.
	Stop-N-Go (1976)	Retail grocery chain.
	Walter Norris (1976)	Industrial distribution.
	Applied Financial Systems (1977) <sup>1</sup>	Computer software.
	Kar Products (1977) <sup>1</sup>	Equipment distribution.
Union.....	Molycorp (1977)	Rare earths.
Occidental Petroleum.....	Adtek (1974) <sup>1</sup>	Design, construction, engineering.
	Squamish Chemicals (Canada) (1975) <sup>1</sup>	Chemicals.
	Zoecon (1977) <sup>1,2</sup>	Pesticides.
Ashland.....	Anchor Construction (1974) <sup>1</sup>	Heavy construction.
	McClinton Bros. (1974) <sup>1</sup>	Construction materials.
	North Western Arkansas Asphalt (1974) <sup>1</sup>	Heavy construction.
	Lehigh Valley Chemical (1975)	Chemicals.
	Levingston Shipbuilding (1975)	Shipbuilding.
	AB&H Processing (1976) <sup>1</sup>	Mining.
	Coastal Chemicals (1976)	Chemicals.
	Commonwealth Equipment (1976) <sup>1</sup>	Mining equipment.
	General Oils (1976)	Petroleum.
	Highland Tractor Service (1976) <sup>1</sup>	Mining equipment.

<sup>1</sup> Acquisitions involving cash.<sup>2</sup> Less than 50 percent acquisition.

Source: Business Week, Apr. 24, 1978.

STATEMENT BY THE AFL-CIO EXECUTIVE COUNCIL ON OPPOSITION TO OIL  
DECONTROL

The President's decision to start decontrolling crude oil prices on June 1, 1979 is based neither on economic logic nor compassion for the needs of the people. Decontrol must be stopped.

Crude oil prices will rise by at least \$16 billion a year plus inflation if the President's decision is not reversed. Other energy price increases, following the lead of oil, will match or exceed that figure. As the effect ripples through the economy, many more billions of dollars will be added to the cost of producing goods and the prices consumers must pay.

In the past three months alone, the wholesale price of gasoline has increased nearly 10 percent and heating oil prices have gone up almost 13 percent. Decontrol will accentuate the already steep rise in oil prices and their products, with similar increases in other energy prices.

At a time when the Administration professes to be fighting inflation—at least by holding wages to 7 percent—there is no justification for sanctioning exorbitant oil price increases that will further pad bloated oil company profits.

The Administration contends that decontrol will encourage additional oil production of about 600,000 barrels a day by 1985. The Congressional Budget Office estimates additional production at about 500,000 barrels a day and says that even without decontrol a significant amount of this would have been produced.

While the Administration also claims that decontrol will encourage conservation through higher prices, CBO estimates this, at best, to be a savings of less than 2 percent by 1985.

This is "rationing-by-price," the most unfair system of rationing that could be devised.

The burden of decontrol will fall most heavily on low-income families. A larger share of their income will have to be set aside for energy costs. On a conservative estimate, a family of four will have increased energy costs of more than \$500 a year.

The AFL-CIO urges that maximum support be given to House and Senate efforts to reverse the President's decision to decontrol oil prices and to maintain the current system of oil price control.

STATEMENT BY THE AFL-CIO EXECUTIVE COUNCIL ON ENERGY PRICES AND  
SUPPLIES

At a time when inflationary fires are burning full blast, it would be ill-advised and untimely for the Administration to initiate measures to remove ceilings from gasoline retail prices and to decontrol crude oil prices. Both of these steps, now under consideration by the Administration, would increase inflation and dampen economic activity.

By the Administration's own estimates, gasoline prices would rise about 4 cents per gallon if controls are lifted. Others estimate the increase resulting from decontrol at a higher level. Each one-cent increase in the price of a gallon of gasoline would cost American consumers about \$1 billion a year.

Certainly, if the Iranian cutoff of oil continues and shortages develop, decontrolled gasoline retail prices would rise even more dramatically. Gasoline makes up about 46 percent of domestic oil products. Motor vehicles consume 90 percent of the gasoline.

Mandatory controls on crude oil prices expire on May 31, 1979. However, the President has the authority to continue controls until September 1981.

Decontrol of crude oil prices would have an even more devastating inflationary impact. If domestic crude oil prices were to rise to world levels, the direct cost to American consumers would be about \$14.5 billion per year.

In addition, there would be a ripple effect throughout the economy, the cost of which is difficult to calculate. In the past, the Library of Congress has estimated the ripple effect at 1½ to 2 times the primary effect. In truth, decontrol of domestic crude oil prices is a submission to the OPEC cartel and establishes its prices as the U.S. price.

Obviously, the economy would suffer from such an action, and consumers would bear the burden of the effects of decontrol. Only the oil companies would benefit.

We therefore urge the President not to decontrol gasoline and crude oil prices.

At the same time, the Administration should immediately proceed with programs for both developing domestic energy supplies and conserving existing supplies. Recent developments in Iran demonstrate that America is still too dependent for a critical portion of its energy supplies on insecure foreign sources.

So long as there is the current unequal relationship between the Organization of Petroleum Exporting Countries, and the consuming nations, we can expect continuing oil price increases and resultant inflationary effects. For the U.S. this is compounded by the willingness of U.S. oil companies to cooperate in these price increase schemes. The only solution is for the U.S. to develop an import-purchasing mechanism at the governmental level which can deal as an equal with OPEC nations. We, therefore, call upon the government to establish an Energy Import Board, with sole authority to determine the level of U.S. imports and to allocate oil imports, to negotiate with suppliers to develop a purchase mechanism and to take any other steps necessary to end the stranglehold the OPEC nations any other steps necessary to end the stranglehold the OPEC nations and the major oil companies now have on the American economy.

While every effort must be made to increase domestic production of oil and natural gas, there is an urgent need to develop all alternate sources of energy. The energy. The two sources most likely to be of greatest significance in the short run are coal and nuclear power. The accelerated development of nuclear power and coal must be relized while protecting the environment and maintaining stringent safety and health standards.

The United States has about 450 billion tons of coal reserves—more than 700 times the national annual usage. The country could double or treble coal consumption and still have reserves that would last more than 200 or 300 years.

Nuclear power currently constitutes a little more than two percent of total energy supply. The accelerated development of nuclear power could considerably enlarge that figure and make a major contribution to the resolution of the energy problem. To accomplish this, the licensing of nuclear reactors should be expedited and safe federal repositories established for nuclear waste.

At the same time, programs for development of alternative sources must be directed towards such other sources as solar, biomass, fusion, geothermal, gasohol, coal liquefaction and gasification, wind, tidal and any other sources.

Private industry, left to itself, cannot or will not develop the alternative energy sources needed by this country. For that reason, the AFL-CIO believes an Energy Independence Authority should be established to help achieve energy security for the United States, including the power to launch projects for the production and distribution of energy patterned after the TVA concept.

But the immediate threat of gasoline shortages means that the United States can no longer wait before implementing a conservation program that is fair, realistic and effective.

We believe any attempt to ration gasoline by raising prices, either directly or indirectly, is inherently unfair and will not work. Likewise we believe rationing based only on registered motor vehicles, without any provision for allocation on the basis of need, adjustment of inequities or the alleviation of individual hardship must be prevented.

We urge the Department of Energy to consider more than just the views of industry sources. A program designed without meeting the concern of labor and consumer groups would be suspect on its face and would be certain to fail.

Mr. OSWALD. Thank you, Mr. Chairman.

Senator GRAVEL. I would like to cover a few points with you. First off, comparing the United States to Japan and Germany, both countries have less unemployment than we do. Both countries have less inflation than we do. Japan pays \$2 to \$2.30 at the pump for their gasoline, Germany pays \$2.00-plus at the pump, and they are considerably more dependent on imported sources than we are, to the tune of 90 percent in each case.

How do you reconcile the health of their economy and the difficulties that our economy is having with, one, unemployment and, two, inflation on a comparative basis, just using energy as a criteria? In both cases energy is deregulated in Germany and in Japan.

Mr. OSWALD. Mr. Chairman, I believe that in both cases they have alternative means of transportation that are not available in the United States. In both countries there is a excellent mass transit system and a very excellent railroad system which is not true of this



country. So, that for most Americans, the automobile is essential in order to get to work. So, that I don't think that the dependence on the automobile is the same in either Japan or in Germany.

In Germany particularly a substantial part of that \$2 a gallon that you speak of is made up in taxes and much of that is used for other policies and programs in addition to just energy-related use of taxes imposed on gasoline. I believe that their overall economy is healthier than ours because they also have fostered full employment much more effectively than this country has.

Senator GRAVEL. How would you control the Arab nations? You can put on wage and price controls here. You can put price controls on what natural gas will sell for and what oil will sell for. That is what we have been doing for the last 3 years and this problem has not abated. How are you going to do that with respect to the Arabs?

Mr. OSWALD. Mr. Chairman, we believe that rather than having the individual companies deal with the Arab countries in terms of buying the oil from them individually, we should have the Government set up an import board, an energy import board, that would deal with those OPEC nations because it is with the nations that they are dealing with. We feel the most effective method to deal with these nations would be to have a Government activity, an energy import board that would deal directly with petroleum exporting countries so that they would negotiate the price and the amount that would be imported in the United States.

Senator GRAVEL. Why would the board be more successful than the oil companies?

Mr. OSWALD. Currently the oil companies make their own decisions in terms of allocation of oil. They get whipsawed in terms of the individual spot prices that they are paying. We believe that the ability to have the force of a government negotiating with a government allows them to in essence have equal force on the other side of the table in terms of trying to establish what the price will be.

Senator GRAVEL. How do they exercise that force? If they don't want to sell us the oil at a lesser price—we are negotiating with them in foreign affairs all the time—how would we have an impact on Kuwait lowering the price of their energy? I don't know if you are aware that OPEC was formed as a response to the oil companies rolling back the price that they were paying the Arab world, Saudi Arabia, and Kuwait at the time. It was that insult that caused them to form OPEC. I would like to see how a Government board would sit there and buy for the whole United States and push that price down.

How would they do that?

Mr. OSWALD. Currently, the United States buys approximately 50 percent of their output. Instead of our bargaining with them for that output, as individual companies we feel that the OPEC nations deal with them in terms of their sales for Japan, for Europe, for the United States, for all the places that they have an interest, which may or may be in our own best interest, and then make allocations according to how they view the allocations should take place.

We believe that the United States, through a formal negotiation, could actively affect the price that is being set through a ceiling with individual companies who act as nation states of their own.

Senator GRAVEL. You said that and accept that. Let us say we are importing 8 million barrels a day. Now we are going to sit down and have a Government bureaucrat who is going to sit there and negotiate with Venezuela, with Saudi Arabia, with Kuwait, with Nigeria. How are we going to muscle them into taking a lesser price?

Mr. OSWALD. The same way that we negotiate with them in terms of providing them foreign aid, the same way we provide them with other items. I am very shocked, for example, to see a proposal in the new trade legislation that would give these countries the ability to have zero tariffs under title V of the Trade Act for oil producing countries. There are a number of items that we can deal with in terms of trading with these countries in a country-to-country situation that the individual companies do not have.

Senator GRAVEL. Let us say they don't bend. What do we do? Do we deny them their computers that they can buy from France or Japan? Do we deny them food that they can buy from Argentina? The only way we can do it is strike them. When we strike them, we bankrupt the United States. The only way we can beat them, as I see it, is to have the oil and kiss them off. We would need 8 million more barrels a day to play that game.

Regardless of how small they are, we have to walk softly with them until we become independent. Until that time, I don't know what you can do to threaten them. Whatever you can deny them from this country they will get from another country. Maybe the other countries do not want to punish them as badly as we do, and destroy themselves economically. How would the board work differently in that scenario?

Mr. OSWALD. I think that the difference is that it is a question of who comes first and who comes last in the pricing arrangements. I would believe that any large buyer would have more leverage, if he could control 50 percent of the market for the product, than would individual buyers. Essentially, the United States is a buyer of 50 percent of the OPEC oil production.

Senator GRAVEL. No, just for the United States. I don't have the figures, but it is not 50 percent. It is 90 percent of Japan. Essentially, it is almost 90 percent of all the other OCED countries and only 50 percent of ours. It is not 50 percent of our sales. We buy only a third of what Saudi Arabia produces. They would like to cut it down. They would be as happy as clams to cut the production down to 3 million barrels. They are producing at that level because we are begging them to produce at that level.

Mr. OSWALD. We do need an independent energy ability in the United States and our policy, as we set forth in the statement attached on energy prices and supplies, supports energy independence in this country.

Senator GRAVEL. I have difficulty accepting that because, if you take the premise that you can't control that OPEC supplier price and they can, then what happens is that all you are doing is restricting the price an American can produce it at, opposed to what an Arab can produce it at. You wind up subsidizing the Arabs, and an unbelievable transfer of wealth that has taken place continues. Is this what we want, to have everything owned by the Arabs in this country?

Mr. OSWALD. Senator, we believe that there should be rapid moves towards energy independence in this country. Five years ago we appeared before the Finance Committee and supported the proposal of then Vice President Rockefeller for energy independence. We believe that, if those steps toward the development of alternative energy sources had been undertaken, we would be well along today towards greater self-reliance in terms of energy. We believe it is long overdue that we move in that direction.

We believe that the answer is not to provide all the windfalls that occur to corporations as a result of a price that is set by OPEC, to automatically inure to those companies which already have had substantial increases in prices over the last ten years, price increases of five- and six-fold from whatever they were 10 years ago. Newly discovered oil 10 years ago was at approximately \$2.80 a barrel. Today new oil that is discovered can be priced at \$17 a barrel. The previous spokesman talked about natural gas where the price has already gone up more than fivefold in the past decade in terms of newly discovered natural gas. We believe that these items essentially provide substantial returns for the discovery and exploration for new gas and new oil.

We believe that further price changes should be related not to whatever OPEC decides to set as the price but what is a reasonable return for American corporations that still assures a move toward energy independence.

Senator GRAVEL. What is a reasonable return?

Mr. OSWALD. The average, Mr. Chairman, for all corporations has roughly been in the range of 13 to 14 percent historically in the United States. The oil companies, as they indicated in the first quarter of this year, were running rates of return anywhere from 19 to 32 percent.

Senator GRAVEL. In my State we have a lot of the oil companies who are deeply concerned because we make our money. No matter what, we tax the oil companies. I think we take them more than any other State. That is at variance. I see the figures you have on page 3, the figures that you are citing where the 2 years 1974 and 1975 which were hiatus years when a lot of inventory profits were taken. When you take the report which is published in Time magazine recently, which certainly is no friend of the oil industry—no media that I have found is—in the last decade they have been below the average for manufacturing. You take the 2 years when this fourfold increase takes place, but the fact is, for the last decade oil stocks have not sold any better than other kinds of stocks, so that picture has not been there.

I know of mobile homes that are sold to poor people in Alaska, and they make a profit. They are always on the top of Fortune's 500. There is a lot of economic activity that takes place in the industrial part of the United States where my people pay. Following your criteria, they should all be regulated.

Mr. OSWALD. We believe they should be regulated because they do control a large sector of essential service for Americans. As I had indicated, in refining the 20 largest companies control approximately 83 percent of the refinery capacity. It is not that it is a luxury that we can do with or without. It is essentially the equivalent to a monopoly utility for many people. In your own State, it is not that there are all independent separate oil companies operating. Many of them are operating in consortium with one another so that they become inter-related. We believe, as a result, that they really act in concert and that

the only protection for the consumer, for such a required necessity as a utility, is through continued regulation.

We don't believe that everything is a necessity in life, but energy certainly, in terms of home heating oil, in terms of transportation, in terms of getting to and from work, is a necessity for the majority of Americans.

Senator GRAVEL. Certainly food is just as necessary as energy. Why should we not regulate those items?

Mr. OSWALD. Neither of those is controlled by the 20 largest corporations.

Senator GRAVEL. I would submit for the record that we have extensive testimony that shows 10,000 independents do upwards of 70 percent of the discoveries in the United States. That is not true in Alaska because of the high cost. What about the automobile industry? Should that be regulated? There is less competition there than exists in the 10,000-plus energy companies.

Mr. OSWALD. Earlier, Senator Baucus made reference to the anti-trust laws at the end of the last century and the early part of this century. We believe those antitrust laws have not been able to be effectively enforced against various corporations, and I would include the automobile industry in that area. I believe that effective antitrust action is one alternative method in terms of the oil companies.

We have also urged that there be divestiture of the oil companies of their related holdings in other energy sources, such as coal and uranium, because we feel that they treat these other energy sources as related to their primary interests in the oil industry and thus become greater monopolists in terms of the energy industry.

Also, Senator Baucus did raise questions about, at what point do these people become too large. It reminds me of the antitrust case in the early 1920's when Rockefeller control of the oil industry through Standard Oil of New Jersey was ordered to be broken up by the courts because it controlled too much of the industry. We believe that, similarly today, the integration of much of the industry, from exploration through refining, pipelines, to retailing, again provides excessive market power within these areas.

If there really were greater competition, there might really be better price allocation so that we wouldn't need, in the interim, to have control. Since it takes so long to get antitrust cases through, we believe it would be best for Congress to act directly, both in terms of divestiture and hopefully in terms of maintaining price control, until greater competition can be brought about in the industry.

Senator GRAVEL. We had testimony earlier also from a former staff member of Senator Hart. He was in charge of antitrust activities. He now represents the marketers in the United States. He talked of the additional cost of all of the new brokers that have come into being as a result of Government regulations and all the interim profits being taken by individuals. We had last night on 60 Minutes a similar situation where you had all these new people come into the business who manipulate deregulations, the brokers, sort of middlemen who feed off the bureaucracy that we create. This is where we attribute most of the cost; at least these individuals, 60 Minutes, and the testimony we received attributed most of the cost there. If you have everything all broken up, which would be ideal, each element is going to have to make this average manufacturing a 13 or 14 percent profit.

Have you made any investigation to see if the present structure produces 13 or 14 percent profit at the transportation, at the fuel pump, at the refining, and at the wellhead? Do you have any data to substantiate that that is what they are making now?

If that is not what they are making now, then if we broke them up, we would increase the cost to the consumer.

Mr. OSWALD. Mr. Chairman, we tried to look at attributing prices to particular aspects of integrated companies. It is very, very difficult, as you know, because that is an internal pricing decision of the corporations and may or may not reflect actual cost related items. As you know, the State of Alaska has struggled with part of that issue in terms of what are the costs related to a particular portion of that whole flow mechanism. But the total profits, if they were for 13 percent on the average, would not be higher if you broke them up than if it is combined in terms of the total profit picture.

Senator GRAVEL. That is at variance with what I have seen. I certainly will leave the record open if you have anything to say that it is in-house accounting. All of these profits are reflected in the marketplace. We have all of Wall Street that does nothing but study what profit corporations are doing so that they can advise their people how to invest. If they give them good advice, they make money. If they give them bad advice, the people don't come back again. We have hundreds of thousands of people who are experts in this field who say, buy Exxon or buy Arco or buy Pepsi Cola. If the profits you are talking about would be average manufacturing on each one of these areas, then they would be showing a better profit picture than they have historically, which has been somewhere between 9 and 12 percent.

Mr. OSWALD. They have shown substantially better since 1973.

Senator GRAVEL. For 2 years. Out of a decade, that is not what you call a great track record.

Mr. OSWALD. I think the point that I am trying to emphasize is that, at periods when we have had substantial increases in prices, we have also had substantially high profits among these corporations. I believe that part of the impact of the rapid increases in prices does resound to substantially higher profits for the oil industries.

Senator GRAVEL. I can only say that, to give you an example, Alaskan natural gas, when it gets down here, will probably cost \$6. Our oil is now sold at world prices and that even has problems. So you are talking about the continued regulation. You are not going to be able to get the oil and gas out of Alaska that you need to keep the employment working in the balance of this country. These are just facts.

Mr. OSWALD. From what I can recall, when the pipeline was first being discussed, it was thought that at \$8 a barrel the oil would be profitable for the corporations to produce. As you indicate today, it is selling for nearly double that amount, or 50 percent greater than that amount, in terms of the actual sale cost for Alaska oil.

Senator GRAVEL. Except that the price of transporting that went from \$1 to \$8 billion, and a sizable portion of that went to the people who worked on that pipeline who took back those handsome wages both in Alaska and the whole pipeline was un-unionized. I was instrumental in seeing that that did come about. The people made big money out of it and took the money back to their homes. Most of the people who worked on the pipeline were outside of Alaska. They were

unionized and they carried the big money back. Of course obviously the environmentalists shared that. That went from \$1 to \$8 billion. So the transportation cost alone, which is just in the pipeline, is \$6.

From Prudhoe Bay to Valdez in the pipeline itself, not the gathering lines or the wells, just that pipeline, it is \$6. So if we are looking at \$8 oil that was going to sell attractively, thank God we had the increase because they would have had to shut the whole thing down as part of one great big gargantuan situation.

I will yield to my colleague.

Senator CHAFEE. I just want to ask one question of Mr. Oswald. As I understand it, what you are proposing is to keep the status quo, is that it?

Mr. OSWALD. Status quo ante, Mr. Chafee. We would propose that controls be maintained, that there not be the 2-year phaseout or decontrol that the President has already started, and that will, we believe, bring about windfall profits to corporations without necessarily bringing about any greater discovery of oil or any other greater output of oil.

Senator CHAFEE. It seems to me and you can correct me if you see something in the present situation that I don't see, but it seems to me that the present situation is a disaster. We have all the worst things happening. We have shortages of supply. We have constantly rising prices. We don't have enough oil being discovered. Your proposal, it seems to me, is to stick with controls which compounds an unsatisfactory situation.

Mr. OSWALD. Mr. Chafee, I believe that the answer to the current shortfall is not just purely a matter of existing price controls. For example, the interruption of the Iranian oil supplies had nothing to do with the U.S. price controls.

Senator CHAFEE. Before the Iranian interruption our imports had increased from the level they were at when the first embargo went on in 1973, 30 percent, to now around 50 percent. Somehow we have to solve that problem. Somehow it seems to me we have to get out of being trampled by the foreign oil producers. How are we going to do that?

Mr. OSWALD. We believe what we need to do is develop alternative energy sources, to follow U.S. policies that encourage investment in the United States rather than abroad. For example, the foreign tax credit that is provided to oil companies in terms of taxes paid and royalties paid abroad is an encouragement for foreign activities rather than U.S. activities.

Senator CHAFEE. Suppose we end that? That discourages exploration abroad. What do we do to encourage exploration in the United States if all profits are going to be taxed away under your proposal?

Mr. OSWALD. We are not proposing to tax away all profits.

Senator CHAFEE. Eighty-five percent of them.

Mr. OSWALD. Over the current levels 85 percent of the excess. Table 1 of our testimony indicates that even at that with the President's proposal the effect of windfall profits tax rate on after-tax income at his 50 percent rate only amounts to 25 percent effective windfall tax rate. What we are proposing is that new oil would come in at the current \$17 but that the old oil that once was profitable at \$2.80 a barrel, that cost nothing more really to be pumped out which under the current regulations has moved to over \$6 a barrel, not be allowed to

move automatically to \$17 a barrel where the only impact of it is on the consumer in the United States and no increased cost to the producer at all.

We believe that sort of price control under these circumstances should be maintained so that such windfalls do not occur.

Senator CHAFEE. But it has not resulted in increased production now. That is the problem. What you are suggesting is go along with the way things are and things will be all right. I have problems with that.

Mr. OSWALD. Mr. Chafee, we are not convinced that necessarily raising the price to whatever OPEC decides is the appropriate method by which we should set oil prices in this country.

We believe that they should be related to cost, that they should be related as they are currently under the regulations that have existed in terms of new oil prices, they can go above \$17 if the costs are higher as long as the average prices remain in this general level. We believe that in terms of the impact on consumers because of the dire necessity that oil is for people in terms of heating, in terms of transportation, that it should be treated as a utility the same as we control the prices that are set by electric utility producers because they are a monopoly. We believe these large oil companies in terms of how they corner the market are also monopolies in this energy utility area.

Senator CHAFEE. I heard you make that charge here when Senator Gravel was questioning you. It seems to me that is a rather serious charge. You said they were all working in collaboration. That is a pretty straightforward charge that they are all violating the Anti-Trust Act.

Mr. OSWALD. I am not charging they are violating the Antitrust Act. We will allow them the ability to act as a consortium to build a pipeline. I believe it is seven companies that are owners of the pipeline in various proportions. There are a number of joint ventures in the Alaska area. There is a variety of joint ventures that interlock the companies in similar interests. I would be glad to try to provide a list of examples of such joint ventures by the oil companies.

Senator CHAFEE. The problem, it seems to me, Mr. Oswald, is that for some reason we are not finding the alternative sources of energy or the added supplies of energy that we seek. It has proven more economical to go abroad and buy the oil there, bring it here and sell it for whatever it is being sold for than it is for our companies to go out and discover and drill it here.

This includes additional sources of the current form of energy plus alternative sources.

It seems to me the profit motive is a good way of getting people to go out and find more oil and discover alternative sources. But you seem opposed to that.

Mr. OSWALD. Senator, if it were not such a necessary item, if it was just a luxury, we would say let the price determine the supply and have it all related to whatever people can afford. But it is a necessity for people.

Senator CHAFEE. Should we control the price of building houses?

Mr. OSWALD. If it were controlled by 20 companies I think we would have to.

Senator CHAFEE. The testimony we have had here before, which may be all wet and we will be glad to hear from you on that, is that there is a variety, I guess the figure quoted by the chairman, is 10,000, of independent producers.

Mr. OSWALD. The data that we have been able to find have indicated that the variety of controls varies at different stages of the production process. The data that we have indicates that in terms of crude oil production the 20 largest companies control 58 percent of the production but in terms of refining production that the 20 largest companies control 83 percent of the actual refining production.

Senator CHAFEE. Just one thing. Twenty companies is a large number of companies. As was mentioned that is a lot more than are in the automotive field or I suppose that are producing refrigerators or any number of things in this country.

Mr. CANTOR. I want to suggest on your figure on the independents, I was privileged to be here too when we heard the expert testimony of one of these independents. As I recall, he said he has absolutely no control over or effect on, the price. The prices are dictated to him by the large oil companies at the wellhead.

Senator GRAVEL. I didn't hear him say that. I thought I was being attentive. By and large, to my knowledge the independents find most of the oil in this country.

Mr. CANTOR. I was not questioning that.

Senator GRAVEL. They sell to the oil companies and they will sell it to whoever gives them the best price. If Amoco gives them a better price they will sell to them. They have 20 majors to bid from. They used to be able to swap around the country. Now they can't even do that, which restricts the problem.

Senator CHAFEE. I have no more questions.

Senator GRAVEL. Senator Boren.

Senator BOREN. Dr. Oswald, you talk about the need to develop alternative energy sources in the United States. I presume this would include such things as liquefaction from coal, synthetic fuels and so on. If we followed your proposal and we reimpose control and keep the price at \$5.50 a barrel for domestically produced oil, why would companies have an incentive to go out and develop \$22 oil equivalency or \$25 oil equivalency which would be the range of many of these competing alternate sources in terms of cost?

Mr. OSWALD. Senator Boren, we are not suggesting that new oil not come in at more than \$5.50 a barrel. We are talking there about old oil. We are talking about helping develop alternative sources at prices that we were once told that you could justify, make synthetic oil from oil at a price of approximately \$6 a barrel. Later it was \$9 a barrel, and then \$12 a barrel. I am not sure that it is \$22 a barrel. Clearly, South Africa currently is undertaking and is producing in a major way oil from coal. Australia has also gone ahead with its own activities in terms of producing oil from coal without doing it necessarily at prices that are prohibitive.

Senator BOREN. Would you agree that the way to find out when it becomes profitable or a break-even point to switch from one field or the other is to let the market set the price so that you can determine where this point is?



Mr. OSWALD. As a general proposition I think that would be true if in the meantime it did not have such disastrous results on the economy and people who depend on oil for heating their house and driving their cars. I think what we really failed to do is provide the sorts of assurance that there will be control of oil prices that will be responsive to consumer needs as well as reflect in essence the actual cost of production and means of expanding production.

At some point it may be that we have to use Government funds as we did to help develop all sorts of new procedures. We used it for the space program, we used it for the Manhattan project in World War II, which since then has been converted into peaceful uses of energy.

We have done it in terms of developing a whole host of policies and programs in this country. We are not saying that price controls necessarily are a freeze on prices but we are saying that it requires a type of making sure that the price is a reasonable price in terms of actual cost and in terms of the relation to the concerns of consumers.

Senator BOREN. I gather that you want to see us produce more energy domestically of all kinds so that we can be free of OPEC domination. The figures I have seen would indicate that if we are going to maintain full employment in this country, which I am sure is a goal you would share with us, and if we are going to reduce our dependency on foreign oil to perhaps a third by the end of the century we would have to invest in this country somewhere between \$500 and \$700 or \$800 billion more than the current rate of investment would be required. In other words, it is going to take capital expenditures of somewhere between \$500 and \$700 or \$800 billion additionally above what we are now doing.

That would include the costs not only of producing oil, gas, coal, but also synthetic fuels. It would include such things as retooling plants to produce more energy efficient automobiles, conservation in use of buildings, all sorts of other expenditures. My question is how would you generate this capital? Where would the \$500-\$800 billion come from that is necessary to get us off the treadmill on which we now find ourselves and which Senator Chafee has described? Where would that money come from?

Mr. OSWALD. Senator, I have seen the same estimates that you refer to. I believe that those estimates are very greatly exaggerated in terms of the various alternatives that have been essentially discussed by most people in terms of short-term realistic alternatives. The question of capital formation I believe is one that is often described as if we were still in the same situation that we were 100 years ago—that the only capital formation in essence came from rich individuals. If you look at the change that has taken place in terms of the growth in funds and pension plans and insurance, life insurance plans, in terms of mutual funds, the growth has been substantial in terms of providing additional capital for investment.

I believe that one of the items that this country disregards, however, is whether those investment funds will be used in this country or in some other country and too often we have provided incentives for moving capital abroad rather than providing investment in this country.

Senator BOREN. Suppose you want to cut my figures in half and say I have exaggerated by twofold what is necessary. Maybe it is \$200 billion. Now the money that gets into the pension funds, for example,

has to be generated somewhere. It has to come in some way from the pricing structure—we are not arguing here about what share of the prices might end up with the workers.

They might put them in individual savings with proper incentives or pension plans or the other kinds of programs but it has to be formed in some way. Have you or has the AFL-CIO come up with any kind of strategy for developing or forming the amount of capital that we need or would you rather see it taxed away by the Government and put the capital in the hands of Government? It has to come from somewhere. The question is where would you suggest that it come from?

Mr. OSWALD. Mr. Boren, I don't believe at this point we have seen what you would call a capital shortage. If anything, the amount of funds available for investment are being restricted now by Government policy in terms of the very high interest rates and the very tight strictures of the Federal Reserve system. The amount of funds available for investment have not been a matter that has curtailed the amount of investment in energy. If there is a shortage, then maybe we should look toward how we can direct it toward those areas where we need it. I don't believe that we necessarily need to develop a large casino operation in Atlantic City in terms of developing the Nation's welfare but I do believe that the development of energy is a productive use of capital.

Senator BOREN. I would agree with that. Of course I favor some sort of plowback proposal that would help direct where the money would go. I still am at a loss as to how you would come up with the money necessary.

I do think capital formation is a problem whether it is here or elsewhere because we in the United States are now at the lowest rate in the Western World in terms of our capital investment ratio. This of course is greatly exacerbating the balance of payments and causing the productivity of labor to fall. I wonder why you didn't list the rate of profitability for the last 2 years in the oil industry? I see your chart includes 1975 but not 1977 and 1978.

Why don't you go all the way through in a composite for the industry and not just talk about the majors? Isn't it true that the composite rate of return on capital for all of the energy industry including the independents was something like 4 percent in 1978? It was roughly 4 percent in 1977 and 1978 industrywide, composite.

Mr. OSWALD. I would have to check those figures, Senator. I am not familiar with those particular figures. I will be glad to recheck and see what is included and excluded, how much of it is dependent on the very big deductions that are allowed oil companies, as you know, in terms of depreciation and other items that allow much faster writeoffs under our tax codes that do affect some of the rates of return, particularly in the primary extraction activities of the oil industry.

Senator BOREN. Are you aware of the fact that before 1977-78, oil industry returns, again composite, including the 10,000 independent producers as well as the 15 or 20 largest majors you listed here, were below the average rate of return for industry at large in the United States?

Mr. OSWALD. Senator, I am not sure how much of that reflects some of the particular means by which we allow depreciation in this industry versus other industries, and, to that extent, a much faster writeoff.

Senator BOREN. You are not sure whether they are above or below?

Mr. OSWALD. I am saying I am not sure, if you use the similar type of accounting system for oil and gas companies as you do for other gas companies, that you would have the same results. I am saying that some of the results may be the special accounting rules that we have for oil and gas companies in terms of accelerated depreciation.

Senator GRAVEL. Doctor, maybe what we ought to do is just wait until they try to recapture those profits and then tax them at that time. If you have a fast writeoff, all you are doing is deferring profitability, unless you plow it back in. When we do see them pop above 20 percent, then we go ahead and tax them.

Mr. OSWALD. Or they may use it to buy other corporations as the Montgomery Wards, the circuses, and the others.

Senator GRAVEL. They didn't buy the circus. They investigated that. Montgomery Ward, as I understand, was a debt transaction. They didn't have to put up any money to do it. That is the testimony we have.

Senator CHAFEE. Might I ask one question there? One of the points that rather intrigued me was what one of the witnesses from Solomon Bros. said: If there is so much money to be made in oil, why are the oil companies buying these other types of industries? I looked down your list here on table IV and very few of them are involved with the oil industry—automotive exhaust systems, industrial distribution, tape cassettes, retail groceries, chemicals, and pesticides. If there is so much money to be made in the oil industry, it seems to me it would be a dereliction on these companies' part for buying a veterinary chemical business.

Mr. OSWALD. Senator, I believe it is just a means of using the money for aggrandizement. That really means in terms of going out into more industries and using their cash funds and, in many cases, buying them up. In some cases it may have been a transfer of debt, but in many of the situations it was an outright purchase. The current proposal of Exxon in terms of Reliance Electric is a direct purchase type of arrangement. I think that is really an attempt to just get into more and more different parts of different industries.

Senator CHAFEE. You say they are not driven by the profit motive. It is a sort of octopus view to get a better grip on the country in some way? My point is that, if there is so much money to be made in the oil industry, that is where they ought to put their money, but apparently they don't choose to do so.

What is driving them, as you see it?

Mr. OSWALD. I see it really as just a type of aggrandizement and moving out.

Senator BOREN. What do you mean by "aggrandizement?"

Mr. OSWALD. To move into industries in which they had not initially had any type of relationship.

Senator BOREN. Why would they do that if profitability in these other industries was lower? Why, just for the sake of being able to say, "I want to own some other kind of business," would I put my money into something where I would have a lower rate of return and which would upset the stockholders to whom I am answerable? If I could earn 20 percent in one industry, but I bought something where I would earn only 2 percent, would I not be subject to a charge of mismanagement by the stockholders?

Senator CHAFEE. Particularly if you did it on the basis of aggrandizement.

Mr. OSWALD. I think that most firms want to be as large as possible. One of the drives is largely for largeness. One of our concerns in terms of decontrol is, essentially, we will be providing large sums of money to these corporations which may be used in a number of ways that have absolutely nothing to do with additional energy exploration. They have done that already.

It is our concern that all that they are doing is providing greater incentives to do it even more.

Senator BORNE. I presume then, you would not necessarily object to higher prices being paid if you were sure that the proceeds would not be used to buy grocery companies or packing companies or something else, but instead used to actually bring about more energy production?

If you could be assured that the prices being paid by the people of the country would get more energy production in return, more domestic production, would you favor that policy? I would agree with you that we ought to start discouraging overseas investment. Would you be in favor of bringing about more domestic production?

Mr. OSWALD. That is correct. We have not opposed, for example, the payment, as currently occurs under the old regulation system in some cases, of oil as high as \$30 a barrel, newly discovered oil, if that is the cost for bringing it into the United States and if that is something that will make us more independent.

So, in a sense we believe that under the current control mechanism, you do have all the incentives to bring oil in at higher prices, if that is what it costs, but not to raise prices to an artificial mechanism that is substantially higher than cost on the basis that OPEC decides next week, or this week I guess they are meeting, what the new price will be.

Senator BOREN. I am sure you know that the independents over the last 10 years have a record of actually increasing their debt ratios so that they have invested something like 100 percent of their return back into more exploration and production each year. From what you have said, I would assume that you would favor exempting independent producers from taxes if they would plow back what they are getting.

Mr. OSWALD. Senator, I would assume that any corporation would use part of its depreciation for new investment. I think, if you look at the average for all corporations, they invest more than what their profits actually are because they do have depreciation, they do raise new funds on the stock market, and I believe that is an efficient way to raise new funds.

I don't believe that we should just forgive corporations the tax if they spend more than their profits. I think you have to look at its totality of operations.

Senator BOREN. We are talking also about the fact that the debt ratio has increased.

Mr. OSWALD. Nowhere near the debt ratio that existed for individuals in the past, the rate of increase for individuals in the past 10 years.

Senator BOREN. I hear you saying you want more production, but I don't hear you say where you want to generate an additional dollar to put into production.

Mr. OSWALD. We have urged that there be Government funds used if that is necessary.

Senator BOREN. Do you advocate higher taxes on the working people of this country? I believe the Government is more efficient making these investments than the private sector.

Mr. OSWALD. Senator, we believe that, because of the horizontal control, some of the energy corporations offer alternative energy sources, that they have not necessarily developed new energy sources to the best interests of the United States all the time.

We believe that there is a role that the Federal Government can play in terms of encouraging them, and the tax that the consumer may pay, based on an OPEC price decision, may be the cruelest tax of all.

Senator GRAVEL. Thank you very much.

Mr. OSWALD. Thank you.

Senator GRAVEL. Our next witnesses are a team, Kenneth F. Watt and Laurence Steenberg. Could both these gentlemen come forward.

**STATEMENT OF KENNETH F. WATT, DEPARTMENT OF ZOOLOGY,  
UNIVERSITY OF CALIFORNIA-DAVIS, DAVIS, CALIF.**

Mr. WATT. I have a problem. I have a plane leaving Dulles at 6:15. I will have to be very brief.

Senator GRAVEL. OK. You have until five bells if you want. I apologize for the position we have placed you in. We want to give every witness the same opportunity because it is a very important subject. Will you please go forward.

Mr. WATT. I have deposited a long technical statement with the committee. It is unnecessary for me to review it here. The very brief statements I am going to make are supported by tables and charts in the longer version. These tables and charts were derived by statistic manipulation of data from standard sources such as the Statistical Abstract of the United States.

My conclusions sound remarkably different from those of a number of people who have been talking to you. I am simply going to make a series of declarations, and anybody who wants to check these can check them.

1. Without imports, continuation of present trends in U.S. domestic production and consumption of crude oil would totally deplete domestic reserves by 1989.

2. This situation is not the result of a decreased drilling effort in the United States, offshore or onshore, but of imminent depletion of the resource. Just from 1973 to 1976, the number of barrels of new oil discovered per foot drilled in the United States declined from 52 to 18. During the same period, the footage drilled increased by 53 percent. The most recent evidence about reserves of oil indicates that almost all previous estimates were far too optimistic.

I realize that makes me sound as if I had taken leave of my senses. I refer you to the current volume of Science magazine, pages 1,069 to 1,073 titled, "Petroleum exploration discouragement about the Atlantic Outer Continental Shelf deepens: Gloomy scientific appraisal is apparently being borne out by current drilling."

3. The profit margin of oil companies is not outrageous. It is lower than in 1960. If anything, oil company statements probably grossly overestimate real long-term profitability because of the sharply increasing cost of replacing old oil in inventory.

4. If we run out of oil and gas sooner than most Americans expect, we will not be able to replace them quickly with new energy sources. The reason is that national populations of energy generating systems of new types cannot be increased rapidly. Such rapid increase would result in more energy going into construction of the plants than would come out of the population of plants already constructed. Thus, we must plan ahead and conserve to buy time to get new energy systems in place. Present policy is having the opposite effect.

5. Energy can be conserved by increasing retail prices only if the prices increase faster than wages. This has not happened yet. As long as wages increase faster than retail energy prices, in the name of conservation we will use up energy at ever-faster rates.

6. Many people in the United States believe that constant increase in energy consumption per capita is a prerequisite for a high rate of economic growth. Operating on this belief has been a tragic strategic error with far-reaching economic consequences for this country. From 1967 to 1977, rate of growth in gross national product per capita among the 20 most developed nations was negatively, not positively, related to energy consumption per capita. During that period, only New Zealand had a lower rate of growth than the United States. All other developed countries had rates of per capita economic growth much higher than the United States, and these were obtained with sharply lower energy consumption per capita. Further, this phenomenon is not a statistical artifact explained by senescence of the U.S. economy associated with a high level of GNP per capita. West Germany, Denmark, Sweden, Switzerland, and Norway have all been able to combine high rates of economic growth with high levels of GNP, per capita. This was done by keeping energy prices high relative to wages, with resultant low energy consumption per capita.

7. Low U.S. energy prices are causing a sharp growth in the net international trade deficit in mineral fuels, which cannot be compensated for by an increase in other categories of exports. This phenomenon, in turn, is producing a net outflow of U.S. currency and a long-term decrease in the value of U.S. currency relative to other currencies. We are also not only vulnerable to decreased oil production by OPEC. countries, but increased food production in the U.S.S.R., or elsewhere, would make it more difficult for the United States to export enough wheat and other commodities to pay for imported crude oil.

8. Energy prices in the United States, at the retail level, are not outrageously high by international standards, but outrageously low. Relative to the cost of labor, energy in the United States in most recent years has sold for  $\frac{1}{4}$  to  $\frac{1}{100}$  what it has sold at in other countries. Consequently, the U.S. economy has been characterized by a rapid substitution of cheap energy for expensive labor. This, in turn, has resulted in export of jobs, increased unemployment rates, and has been a contributor to high levels of crime and expenditures for police protection. A wide variety of other economic problems result from

energy that is too cheap, relative to the cost of labor, including inefficiency in city design, unwise land use patterns, pollution, inefficient transportation, manufacturing, and insulation of buildings, coupled with bad building design.

The inefficient manufacturing of course contributes to our difficulty in maintaining a positive trade balance.

9. An excess profits tax on oil companies would constitute irrational punishment of resource producers by confused, and uninformed resource consumers who not yet accept that the real problem is domestic resource depletion. We simply must increase the profit margin of all types of energy-producing companies by deregulation, or perhaps high government-imposed floors under retail energy prices. Otherwise, the Nation will experience great economic, social and political trauma in the middle or late 1980's. There must be some policy which has the primary effect of promoting conservation and stimulating, rather than discouraging the search for alternate energy sources, not just including new oil and gas.

After preparing all the materials I did for the committee I had a package of mail from J. Forrester who testified before you because we are both in the American Association for the Club of Rome. I was surprised to discover that he had said very similar things to what I have said and that a lot of other earlier witnesses had also.

I don't care what is done to deal with this problem and I would certainly support the solution he proposed if there is support for it but something has to be done, otherwise we are going to have a garden party in the middle 1980's.

Senator BOREN. You do discuss decontrol as one mechanism for aiding the conservation effort and demonstrating the real cost of energy in terms of competing investment decisions by energy users. Where do you think we can make the most rapid progress in terms of developing alternative energy sources?

Mr. WATT. Solar to thermal.

Senator BOREN. How much money do you think will be necessary for us to make this kind of transition?

Mr. WATT. Starting right now, not when he proposes, 10 times what the President is now proposing to put into it.

Senator BOREN. Something like the magnitude of \$100 billion by the end of the century, I think is what would be generated in terms of total capital formation?

Mr. WATT. Yes. Any of these attempts to rapidly develop new energy sources would deal with our unemployment problem and many other problems we have. They would generate an enormous amount of work.

The basic problem is that we have to muster the political will in this country to redesign the energy society or we will have a problem in the 1980's.

Senator BOREN. Do you feel that we could take the problem and the tremendous crisis which we have and turn it, in a sense, from a negative into a positive? In other words, as we deal with it could we create jobs in altogether new spheres, new sectors?

Mr. WATT. The longer testimony that I have given you argues that almost every major economic, social, and political problem which this country has would evaporate overnight if you did what I propose. The reason we have the social, economic, and political problems is because of the very cheap energy. It is the most terrible thing that has ever happened to a country.

One group of businessmen I was working with on Tuesday made the point that this country finds itself in a novel situation: For the first time in its history it has a very large problem where almost the entire population has a misperception of the true nature of the problem.

Current polls show 40 percent of the population does not believe we are importing crude oil at all, and 75 percent think that it is a hoax perpetrated by rapacious corporations to drive up their profit margins. This is not in conformity with the scientific facts. It is as if we had been attacked at Pearl Harbor and 75 percent denied the attack had occurred.

Senator BOREN. I agree with what you have said. I also agree with your figure in terms of the return we are getting per foot drilled and great decline in the rate. That is one of the mistakes that was made, for example, in the prior administration, in calculating the additional capital that was necessary in discussing the Natural Gas Act. They took the average rate of return in terms of feet drilled for capital cost and using the 20-year average instead of looking at what had happened in the last 3 or 4 or 5 years in terms of sharp decline in yield.

They also have not taken into account the additional cost as we switch to alternative fuels and alternative sources of energy, like solar, which must be developed.

Chairman Gravel was hoping that he would be back. I am going to have to go over in order to vote before the time is up. We do appreciate your testimony very much. We look forward to scrutinizing the technical transcript which you have also furnished the committee.

Mr. WATT. Thank you very much.

[The prepared statement of Mr. Watt follows:]

STATEMENT OF KENNETH E. F. WATT, PROFESSOR OF ZOOLOGY AND ENVIRONMENTAL STUDIES, UNIVERSITY OF CALIFORNIA AT DAVIS

My name is Kenneth E. F. Watt. I am a professor of Zoology and Environmental Studies at the University of California at Davis, although all the remarks which follow are mine alone, and do not in any way represent positions of the University. My credential for making this testimony is that for ten years I have been the director of a team analyzing data and conducting elaborate computer simulation studies of the U.S. and World energy situations, with roughly two million dollars in financial support from a great variety of public and private agencies.

The time allotted me for oral testimony is very short. Hence, I will merely make a series of simple declarations about the energy situation, each of which will be supported by tables, charts or simple analyses in the accompanying document. Then the short review of the crucial facts will be used to evaluate the usefulness of various possible energy policies or prospective legislative packages.

Is there any hard evidence of an energy shortage, or is the energy crisis all a hoax perpetrated by energy companies to raise prices and profits, as many magazine articles claim? A simple index of the U.S. energy situation is the ratio of U.S. proved reserves of crude oil as of Dec. 31 each year to U.S. consumption of crude oil the same year. This ratio is the number of additional years that U.S. domestic consumption of crude oil could be supported by U.S. proved reserves alone, with no supplementation by imports of crude oil from other countries. It is a measure of the time we have remaining before we are completely at the mercy of prices set by foreign suppliers, such as O.P.E.C. This ratio also gives us an indication of the number of years we have left before we must have in place a massive national capability for replacing crude oil with some other source. In 1970, the ratio was 7.09 years, and it has dropped very regularly to 4.10 years at the end of 1978. Projecting ahead by means of a straight-line equation which describes the data very well, we see that that by the end of 1988, the country would have about a 4½ month supply of domestic crude left, without imports, if present trends continue (table 1).

Next we ask if this apparently serious problem is an artifact brought on by a decline in drilling effort in the U.S., or rather results from a decrease in the number of barrels of new crude oil discovered per unit of effort expended in drilling.



We see that there has been a striking drop in barrels discovered per foot drilled, just over the period 1973 to 1976. This occurred in the face of a 53 percent increase in footage drilled (Table 2). Thus the apparent shortage of Table 1 is not due to a decrease in performance by the oil industry, but rather represents an imminent depletion of the U.S. resource.

Now we ask if oil companies are taking advantage of this situation of scarcity to increase profits. In fact, a gallon of gasoline had a lower retail cost relative to unit drilling cost in 1976 than in 1960 (Table 3).

TABLE 1.—THE TREND IN U.S. CRUDE OIL SUPPLIES RELATIVE TO DEMAND

Year	U.S. proved reserves of crude oil as of Dec. 31 <sup>1</sup> (billions of barrels)	U.S. consumption of petroleum <sup>2</sup> (billions of barrels)	Number of additional years U.S. consumption of crude oil could be maintained by U.S. proved reserves of crude oil alone	
			Computed from col. 2 datum/col. 3 datum	Computed from linear regression <sup>3</sup>
1970.....	39,001	5,365	7.27	7.09
1971.....	38,063	5,523	6.89	6.72
1972.....	36,339	5,990	6.07	6.35
1973.....	35,300	6,317	5.59	5.97
1974.....	34,250	6,078	5.64	5.60
1975.....	32,682	5,958	5.49	5.23
1976.....	30,942	6,391	4.84	4.85
1977.....	29,486	6,551	4.50	4.48
1978.....	<sup>a</sup> 27.8	6,776	4.10	4.10
1986.....				1.12
1988.....				0.37
1989.....				0

<sup>1</sup> Table 1322, "Statistical Abstract of the United States for 1978."

<sup>2</sup> Table 1321, "Statistical Abstract of the United States for 1978."

<sup>3</sup> Calculated from linear regression of col. 4 data on year number, where first 2 digits of year number dropped:  $n=9$ ;  $N=33.24-0.3735(Y-1900)$ ;  $r^2=0.959$ .

<sup>4</sup> Calculated from figures in Apr. 2, 1979, news release from Department of Energy.

<sup>a</sup> American Petroleum Institute news release as reported in Sunday San Francisco Examiner-Chronicle for May 6, 1979.

TABLE 2.—THE TREND IN THE NUMBER OF NEW BARRELS OF CRUDE OIL DISCOVERED PER FOOT OF DRILLING FOR OIL IN THE UNITED STATES

Year	Reserves at end of year <sup>1</sup> (millions of barrels)	Reserves at end of previous year <sup>1</sup> (millions of barrels)	Domestic production of oil during year <sup>1</sup> (millions of barrels)	Discoveries of new crude oil <sup>2</sup> (millions of barrels)	Footage drilled for oil during year <sup>3</sup> (millions of feet)	Barrels of new crude oil discovered per foot drilled <sup>4</sup>
1973.....	35,300	36,339	3,361	2,322	44.7	52
1974.....	34,250	35,300	3,203	2,153	51.8	42
1975.....	32,682	34,250	3,057	1,489	66.1	23
1976.....	30,942	32,682	2,976	1,236	68.3	18

<sup>1</sup> Table 1322, "Statistical Abstracts of the United States for 1978."

<sup>2</sup> Reserves<sub>t</sub>—reserves<sub>t-1</sub>—production<sub>t</sub>+discoveries<sub>t</sub>; therefore, discoveries<sub>t</sub>—reserves<sub>t</sub>+reserves<sub>t-1</sub>+production<sub>t</sub>.

<sup>3</sup> Table 1324, "Statistical Abstracts of the United States for 1978."

<sup>4</sup> Col. 5 datum/col. 6 datum.

TABLE 3.—TEST OF THE HYPOTHESIS THAT THE PROFIT MARGIN OF INTEGRATED OIL COMPANIES HAS INCREASED BY ASCERTAINING IF THERE HAS BEEN SIGNIFICANT INCREASE IN COST OF RETAIL GASOLINE RELATIVE TO COST TO DRILL FOR CRUDE OIL IN THE UNITED STATES

Year	Average cost per foot to drill for oil <sup>1</sup>	Average dealer's net price for gasoline (55 cities) excluding tax <sup>2</sup> (cents per gallon)	Price gasoline drilling cost
1960			
1965			
1970	\$13.22	16.08	\$1.22
1973	13.94	15.38	1.10
1974	19.29	17.68	.92
1975	22.54	19.48	.86
1976	27.82	30.54	1.10
	34.15	35.78	1.05
	37.35	38.99	1.04

<sup>1</sup> Table 1324, "Statistical Abstract of the United States for 1978."  
<sup>2</sup> Table 1322, "Statistical Abstract of the United States for 1978."

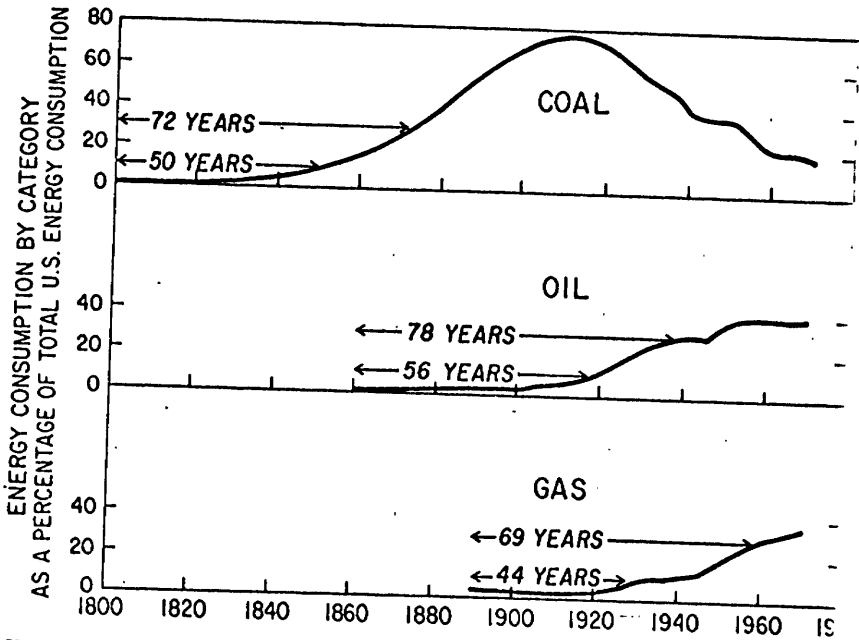


FIGURE 1. The time it took for coal, oil and gas, respectively, to each supply 10 percent, and then 30 percent of U.S. national energy needs. Figure constructed from data in Historical Statistics of the United States.

TABLE 4.—NET ENERGY CALCULATIONS ON POPULATIONS OF NUCLEAR PLANTS, ASSUMING ONE NEW PLANT STARTED EACH YEAR

[In millions of kilowatt hours per year]

Year	Energy invested this year (1)	Energy output this year (2)	Cumulative energy to and including this year			Percent growth in gross output since last year (6)
			Investment (3)	Output (4)	Net (5)	
1	1,784	0	1,784	0	-1,784	
2	3,568	0	5,352	0	-5,352	
3	5,352	0	10,704	0	-10,704	
4	7,136	0	17,840	0	-17,840	
5	8,920	0	26,760	0	-26,760	
6	8,920	0	35,680	0	-35,680	
7	8,920	4,613	44,600	4,613	-39,987	
8	8,920	9,226	53,520	13,839	-39,681	100
9	8,920	13,839	62,440	27,678	-34,762	50
10	8,920	18,452	71,360	46,130	-25,230	33
11	8,920	23,065	80,280	69,195	-11,085	25
12	8,920	27,678	89,200	96,873	7,663	20
13	8,920	32,291	98,120	129,164	31,044	17
14	8,920	36,904	107,040	166,068	59,028	14
15	8,920	41,517	115,960	207,585	91,625	13
16	8,920	46,130	124,880	253,715	128,835	11

<sup>1</sup> Based on tables by John H. Price in *nonnuclear futures*, Ballinger Publishing Co., Cambridge, Mass., 1975.

Thus, it does not appear as if this overall measure of the net financial return of integrated oil companies showed an increase in profitability over the 16 years.

Some people might argue that it is of no concern that the U.S. will shortly deplete its reserves of crude oil and other traditional sources of energy, on the grounds that we have the technological and management capability to get a variety of new national energy generating systems in place within a short time, should the need arise. This raises the question as to how long it would take to do this, and whether there are any immutable laws of nature that might impose a maximum rate of installation of new national populations of energy generating plants of novel types. Figure 1 shows the length of time it took before coal, oil and gas could each supply 30 per cent of U.S. national energy needs. This time period was very long, and also remarkably similar in the three cases, given the extraordinary environmental perturbations that occurred over the 170-year history. The fact that this time only varied from 69 to 78 years among the three cases leads us to suspect that some fundamental law of nature may limit the speed of deployment of national populations of energy-generating plants. There is such a law: the principal is the same for any type of energy, but the arithmetic is illustrated in Table 4, for nuclear plants. The law states that there is an upper limit on the rate at which generating plants can grow, imposed by the fact that if the national population of plants is growing too rapidly, more energy is going into building the plants than is coming out of the plants already built. If a population of plants is growing too fast, too high a proportion of the entire population of plants is either under construction, or has been constructed sufficiently recently that they have not yet produced more energy than that which went into their manufacture. This same argument would apply to Ocean Energy Technologies, windmills, solar energy collectors, or any other type of generating system, as well as nuclear plants. Therefore we must plan ahead for many years: we can not simply run out of energy from existing sources, then get new national populations of plants in place rapidly.

An important point concerning national energy policy and any future planning, concerns evaluation of the role of government as a useful stimulant to development of new energy sources. The record seems clear: if the government, at all levels, had never become aware of something called energy, there would be no national energy problem. No matter which type of novel energy source we consider, the role of government has been to effectively choke off development. For example, the public seems unaware that the U.S. energy industry has now paid 26.5 billion dollars to the federal government in the form of leases, bonuses, royalties and rentals for the right to do offshore drilling. As Alexander Smith explained in *Fortune* magazine for September 11, 1978, industry has not recovered this amount, let alone exploration and development costs. Far from being involved in a ripoff, industry made no profit at all from this entire activity. The May, 1979

environmental Action, available from 1346 Connecticut Ave., Washington, is devoted to solar energy and makes clear the role of government in stifling development. From my conversations with executives in the solar energy industry, it amazes me that federal and state government haven't jointly wiped out the industry totally. The leaders of the industry spend up to 40 days a year testifying before government bodies; one would think it didn't matter that they lost this time to useful work. The bitterness of all energy industries to government is no secret.

Another important feature of the energy situation concerns the sensitivity of use per capita to energy prices. It turns out that it is very difficult to demonstrate an impact of energy prices, by themselves, on use; the variable to which energy use is extremely sensitive is the ratio of energy price to some index of wages (Figure 2). Energy use doubles every time the ratio of unit energy price to wages halves. This fact is of immense importance for government policy: it means that if, in the name of energy conservation, we allow energy prices to

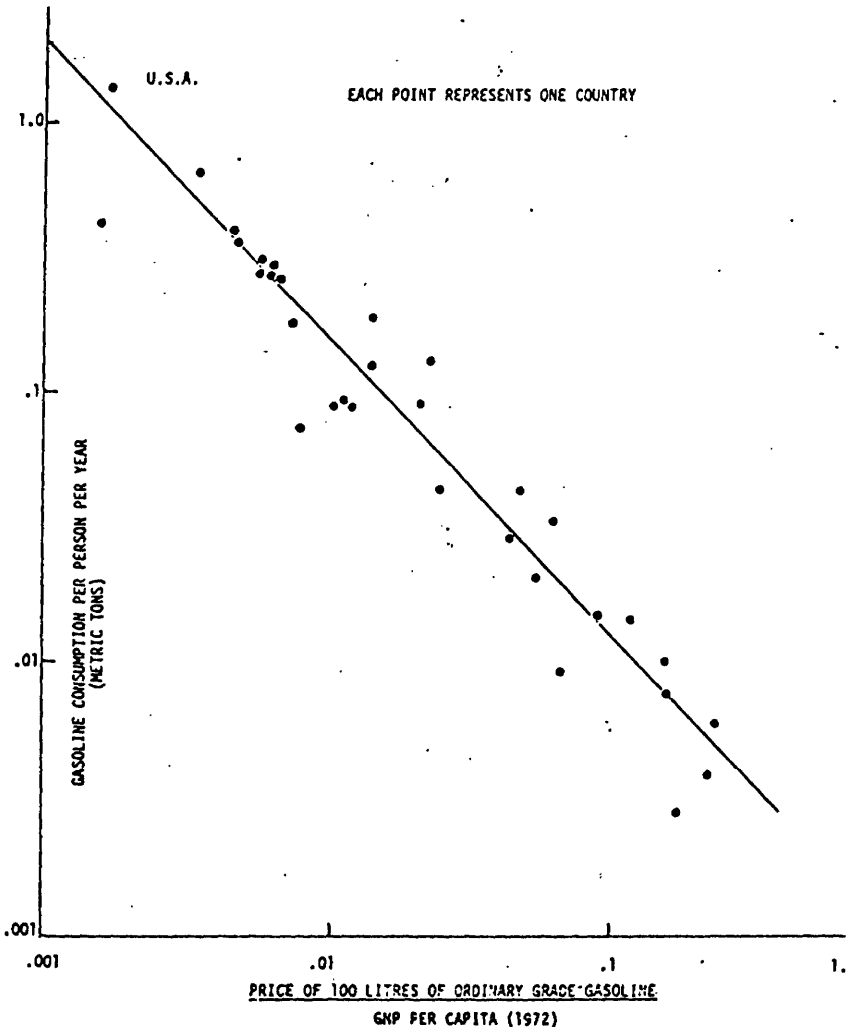


FIGURE 2. The response of energy use per capita to the ratio of energy price to an index of wages. The gasoline price and consumption statistics were obtained from the International Road Federation.

float up 10 percent, but then to avoid alleged harm to consumers or laborers, we let wages float up 10 percent, there will be no conservation whatsoever. In fact, in the name of energy conservation, government policy over the last few years has stimulated, not dampened demand, because of increases in minimum and average wages.

One of the arguments commonly advanced in the United States as to why government should keep energy prices down, is that this stimulates energy use, and constantly increasing energy use per capita is a necessary prerequisite for economic growth. As with all the other propositions I have mentioned, this can be tested by statistical analyses of all the available information. If we take the 20 most developed free-world economies, and do a simple statistical analysis of the relation between their rate of growth in Gross National Product per capita between 1967 and 1977, and their per capita energy consumption, we find the opposite result to that expected by the conventional wisdom. There is a very clear inverse, or negative relation between energy consumption and economic growth: the more energy is used per capita, the lower is the rate of economic growth.

Given the large number of different factors that can affect rate of economic growth, it is startling how striking is the relationship of growth rate to energy consumption. The only really aberrant datum in the set is New Zealand, which has low energy consumption per capita, and a low rate of economic growth. But New Zealand has very small internal markets, and is far from principal suppliers and customers. With New Zealand eliminated from our 20 countries, energy consumption accounts for a surprising 21 per cent of the country to country difference in rate of growth in g.n.p. per capita (Table 5).

TABLE 5.—THE STATISTICAL RELATIONSHIP BETWEEN ENERGY CONSUMPTION PER CAPITA, AND THE AVERAGE ANNUAL RATE OF GROWTH IN GROSS NATIONAL PRODUCT PER CAPITA

Country	Gross national product per capita in current U.S. dollars		Average annual percent increase	Energy consumption per capita in 1972 in thousands of pounds of coal equivalents <sup>3</sup>	Annual average rate of growth in GNP per capita	
	1967 <sup>1</sup>	1977 <sup>2</sup>			From 19-country regression <sup>4</sup>	From 20-country regression <sup>4</sup>
United States.....	4,037	8,715	8.0	25.6	10.3	10.6
Belgium.....	2,079	7,982	14.6	14.3	12.4	12.3
Denmark.....	2,497	8,232	12.7	12.3	12.8	12.8
France.....	2,324	7,176	11.9	9.2	13.4	13.0
Germany.....	2,021	8,371	15.3	11.9	12.9	12.6
Italy.....	1,279	3,376	10.2	6.2	14.0	13.3
Netherlands.....	1,804	7,636	15.5	12.6	12.8	12.5
United Kingdom.....	1,977	4,410	8.4	11.9	12.9	12.6
Austria.....	1,452	6,432	16.0	8.0	13.7	13.2
Finland.....	1,868	6,236	12.8	10.9	13.1	12.8
Greece.....	814	2,860	13.4	3.5	14.5	13.9
Norway.....	2,199	8,805	14.9	10.2	13.2	12.9
Portugal.....	489	1,709	13.3	2.0	14.8	14.1
Spain.....	822	3,199	14.6	3.9	14.4	13.8
Sweden.....	3,041	9,433	12.0	12.7	12.7	12.5
Switzerland.....	2,597	10,035	14.5	8.0	13.7	13.2
Australia.....	2,260	6,664	11.4	12.6	12.8	12.5
Canada.....	2,805	8,312	11.5	23.8	10.6	10.8
Japan.....	1,158	6,017	17.9	7.2	13.8	13.3
New Zealand.....	2,001	4,006	7.2	6.4	.....	13.4

<sup>1</sup> From table 1244, "Statistical Abstract of the United States for 1969."

<sup>2</sup> From table 1560, "Statistical Abstract of the United States for 1978."

<sup>3</sup> From table 1372, "Statistical Abstract of the United States for 1974."

<sup>4</sup> From regression of growth rate on energy consumption, excluding New Zealand:  $n=19$ ; rate =  $15.20 - 0.193$  (per capita consumption);  $r^2=0.206$ .

<sup>5</sup> Same regression for all 20 countries:  $n=20$ ; rate =  $14.40 - 0.150$  (per capita consumption);  $r^2=0.099$

In fact, it really doesn't take any analysis at all to suggest that something is terribly wrong about the conventional wisdom concerning the necessity of high rates of energy consumption per capita for high rates of economic growth. Simple inspection of the data reveals that the United States, with the highest rate of energy consumption per capita of any country over the period in question, had the second-lowest rate of per capita economic growth; only that of New Zealand was lower. Further, well-informed people are now becoming aware that Sweden, with about half the energy consumption per capita of the U.S., had a 50 percent higher

rate of economic growth per capita over the period; Switzerland had a third the energy consumption per capita, and a rate of economic growth 81 percent higher. Evidently, keeping the price of energy down, so as to stimulate the rate of economic growth has the opposite effect. The question is why?

Cheap energy coupled with high wages has a whole range of insidious and terribly destructive impacts on the economy. Cheap energy causes a substitution of energy for labor throughout the economy, and also encourages inefficient use of energy, and discourages technological innovation designed to develop more efficient energy-producing and energy-consuming systems. These driving forces, in combination, promote unemployment, crime, inflation, high rates of resource depletion and pollution, sprawl, or uneconomic use of land, inefficient transportation systems, stifle investment, and wreck havoc with the United States competitive position in the international market for manufactured goods. Ultimately, cheap energy decreases consumer purchasing power, erodes gains by labor, and finally breaks down equitable income distribution. All of these causal pathways can be organized into either conceptual or computer simulation models (the flow chart in Figure 3 suggests part of such a model).

One of the most revealing ways to expose the comprehensive, systemic impact of cheap energy on the economic fate of the United States is to explore trends in the net trade balance with other countries, broken out by category (Table 6). When we do this, we discover not only the well-known increase in net trade deficit in mineral fuels and related materials from 1.5 billion dollars in 1970 to 40.1 billion dollars in 1977. Even more ominous is the catastrophic decline in our net trade balance in machinery, transportation equipment, all other manufactured goods and chemicals, in which the positive balance was only 3.25 billion dollars in 1977, compared to 12.5 billion the previous year. Clearly, the energy-inefficiency in our manufacturing procedures, and in the products themselves is rapidly eliminating us from the international market place. Worse yet, our ability to compensate for all these problems by increased sales of wheat, corn and soybeans is also in doubt: the net position declined from 12.6 to 11.4 billion dollars between 1976 and 1977.

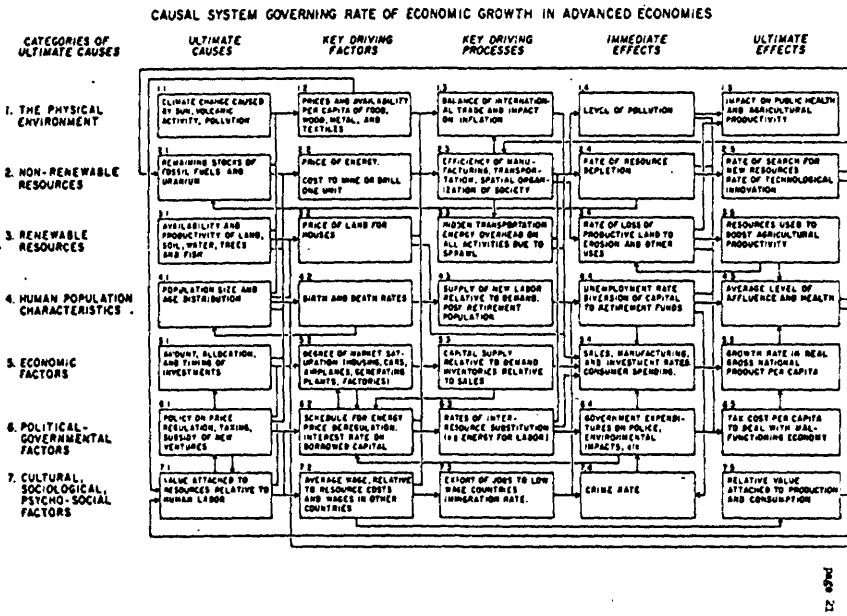


FIGURE 3. Flow chart of a computer model of the U.S. economy. This chart represents only one hierarchical level of the model, and is very highly aggregated. The other levels represent phenomena occurring at the level of aggregation represented by typical metropolitan areas, and smaller urban areas, and at the level of the international trade and monetary systems.

TABLE 6.—THE ERODING POSITION OF THE UNITED STATES IN WORLD TRADE

[In billions of current dollars]

Item	Value of U.S. exports less value of U.S. imports		
	1970	1976	1977
Mineral fuels and related materials.....	-1.5	-29.8	-40.1
Machinery and transportation equipment.....	6.7	19.7	15.5
Other manufactured goods.....	-5.7	-12.4	-17.7
Chemicals.....	2.4	5.2	5.4
Subtotal, manufactured goods and chemicals.....	3.4	12.5	3.2
Wheat and flour.....	1.1	4.0	2.9
Corn.....	.8	5.2	4.1
Soybeans.....	1.2	3.3	4.4
Subtotal, major agricultural commodities.....	3.1	12.5	11.4

The conventional wisdom concerning inflation is that downward regulation of energy prices can serve as a controlling mechanism. However, the preceding discussion about international trade leads into a consideration of causal pathways showing how low energy prices actually increase the inflation rate. The explanations are revealed when we explore the linkages through both the international trade, and the international monetary systems (Figure 4). Low energy prices discourage domestic energy production, and encourage consumption, and both in combination stimulate importation of energy. A principal mechanism by which the U.S. compensates for rising costs of energy imports is rising returns from agricultural commodity exports. But this, in turn, means that our ability to pay for imported crude oil is dependent on crop-growing weather here and in other countries, the acreages planted out here and in other countries, and agricultural technology inputs here and in other countries. Years when these factors combine to make for unusually large U.S. crop exports, domestic stocks of commodities will be run down low enough to produce a significant increase in the price of food.

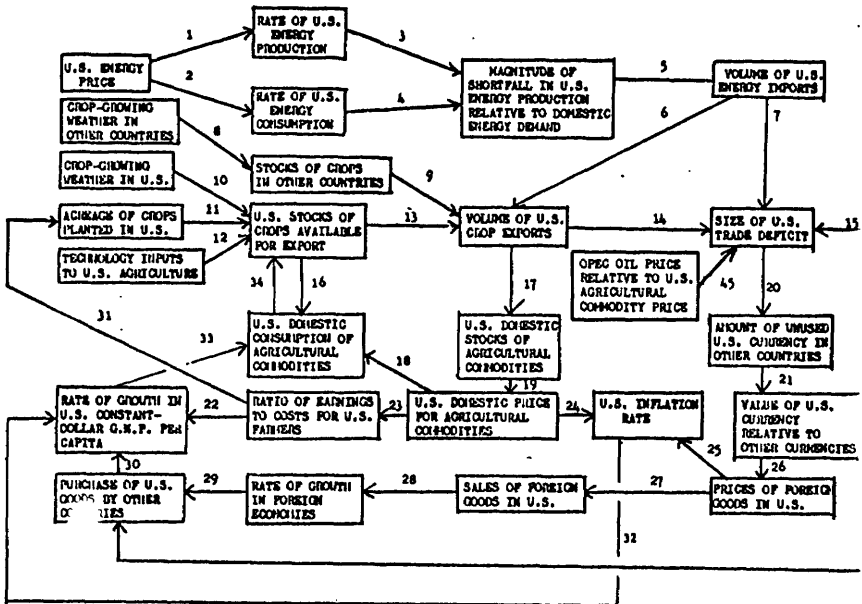


FIGURE 4. The linkages between the domestic and world economies tripped by the volume of U.S. energy imports.

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Years when these factors combine to make for unusually low U.S. crop exports, this country buys crude oil faster than it can pay for it. American dollars pile up in other countries, and ultimately their value drops relative to the value of other currencies. The result is that foreign manufactured goods imported into the United States increase in price, simply, for example, because the yen has appreciated relative to the dollar. This effect tends to spread to domestic manufactured products.

Thus, our massive and growing dependence on foreign crude oil has a variety of effects which lead to higher prices. These, in turn, tend to lead to an increase in the money supply, or inflation. In short, we find a most ironic situation: downward regulation of energy prices by means of government regulation, which is supposed to combat inflation, has precisely the opposite effect.

Further, it is apparent that the causal pathways involved in the international trade of U.S. agricultural commodities to countries such as Russia, to raise the foreign currency required to pay for O.P.E.C. crude oil makes the U.S. economy perilously vulnerable to a variety of kinds of novel perturbations. Only a few of these have been suggested to this point. What happens to our ability to pay for foreign crude oil if our farmers go on strike, for example?

To summarize, there are two different responses the United States could make to the knowledge that domestic crude oil reserves will be depleted in about ten years. One response would be to discourage inefficient and wasteful use of energy, and encourage technological innovation in and search for new energy sources. The other response, and the one now being taken, is to compensate for domestic depletion through massive and rising importation, the economic consequences of which we try to mask or veil by inflating the money supply. The aim of this policy is short-term and purely political: 40 percent of the public believes no crude oil is being imported, and 75 percent believe the energy shortage is a hoax engineered by rapacious multinational oil companies and O.P.E.C. to drive up prices.

Suppose politicians were to take the socially responsible path, and try to avoid setting this country up for a massive and abrupt trauma in the middle or late 1980's? What policy tools are most useful?

One policy being considered is an excess profits tax. As many magazines and newspapers are pointing out, the results would be catastrophic, and for several reasons. This is a time when energy industries need massive amounts of new capital; it no time to be depleting their stock of capital. Further, the notion of taxing "profit" in this instance is misleading in any case. I have already pointed out that we have a situation of dropping new discoveries per foot drilled. This means that present profits are being computed on the basis of the cost to obtain the oil now in inventory, not the cost to replace it, which now appears to be increasing at about 42 percent a year, in constant, not inflated dollars (computed from last column in Table 2). The Economist of London of June 9, 1979 stated the case well: "It is proposed that American oil companies should be mulcted by discriminate windfall profit taxes if they make high profits by getting oil from the cheapest suppliers to the most expensive markets, so a whole generation of American oilmen is being taught to stop being cost-effective businessmen (at which they were once good) and to become diplomats (at which they are internationally disastrous)."

My own stake in this situation is simple enough. The United States has been a great nation, and still has the potential to lead mankind through dark days which may be coming as we make the difficult transition worldwide to a high technology, energy efficient, low population density world. But scholars in many fields make it clear what the inner meaning is when the consumers of a nation begin to whip and punish the producers: the end is near unless the society can muster the political will to reward producers adequately for producing. If the political will is lacking, the United States will follow Babylon, Rome, the Mayans and the rest.

Taxes at the retail level, rationing, and most other energy policies only deal with a subject of our present problems. They certainly do nothing to reward producers and innovators. I advocate total deregulation of all energy prices. If that does not get retail prices high enough to provide adequate incentive for technological innovation, then Government should impose a floor under retail prices, and allow each company to discover through the free play of the market how high above that floor they can afford to set their prices.

If this incredible, and counterintuitive policy were adopted, most of the social, political and economic problems of the United States would gradually disappear as if by magic. Unemployment would decrease, because labor would be more economically attractive relative to energy (mechanization and automation). Crime would disappear after unemployment, followed by burdensome police expenditures. Consumers would finally discover the difference between increases



in purchasing power, and increases in gross incomes, a point on which most people seem hopelessly confused. Taxes could decrease, because the costs to Government of dealing with crime, unemployment, pollution, and all the other consequences of defective energy policy would lessen. This would free up a higher proportion of the capital assets of the society to invest in useful economic infrastructure.

It is amazing the difficulty we have had learning these lessons from Japan and Northwest Europe. Hopefully, necessity will be the mother of invention.

Senator BOREN. We will have to stand in recess briefly. I think Senator Gravel will be back momentarily.

[Brief recess.]

Senator GRAVEL. The hearing will come back to order.

Mr. Steenberg?

**STATEMENT OF LAURENCE R. STEENBERG, PRESIDENT, LAKETON ASPHALT REFINING, INC., PRESIDENT, AMERICAN PETROLEUM REFINERS ASSOCIATION, ACCOMPANIED BY ROBERT KANE, REGULATORY DIRECTOR, APRA**

Mr. STEENBERG. Mr. Chairman and members of the committee, my name is Laurence R. Steenberg. I am the president of Laketon Asphalt Refining, Inc., a small, independent refiner located in northeastern Indiana. I am testifying here today in my capacity as the president of the American Petroleum Refiners Association. I appreciate the opportunity you have provided today to express the opinions and positions of the association's members.

It is important that I preface my testimony with a clear, complete, and concise description of the member refining companies which are represented by this association.

In contrast to the conventional wisdom, the petroleum refining industry is not monolithic. It is composed of several competitive groups, each serving different markets and each fighting different problems. Our association represents the small businessmen of the refining industry, companies whose total refining capacity is less than 50,000 barrels per day.

The current membership consists of 69 small refiners in 25 States, and represents a combined refining capacity of 970,000 barrels of crude oil per day. These small companies differ in significant ways from the other larger companies in the industry:

First, they are much smaller than most of their competitors. This fact presents difficulties in areas such as economies of scale, access to financial markets, cost of capital; but also presents opportunities in areas such as management efficiency and reaction time, innovation, and the willingness and organizational ability to take risks.

Second, they tend not to be integrated, either vertically or horizontally; they are interested in and dependent upon only one business—petroleum refining—and thus do not enjoy the competitive advantages that accrue to heavily integrated international oil companies.

Third, they are independent of their supply of crude oil and must purchase virtually all of that supply on the open market, often from the crude oil production departments of their larger, integrated competitors.

The opinion and positions which I will discuss today are presented for your consideration by these small business refiners, not by the integrated major oil companies or the large independents. In fact,

those larger firms may well disagree with much or all of what I have to say.

Senator GRAVEL. What percentage of the refining market do your small refiners represent?

Mr. STEENBERG. Our association has just under 1 million barrels per day. The total domestic capacity is just over 18 million; that is about 5½ percent.

In addition to that, there is another one-half million barrels per day by people whose size would qualify them for our association but have not joined. So we are talking 8 to 9 percent of the domestic refining capacity.

Senator GRAVEL. The majors, 92 percent then, is the rest?

Mr. STEENBERG. Yes, and large independents.

Senator GRAVEL. Excuse me again. How much would this be of the large independents, do you think?

Mr. STEENBERG. There are seven large independents. There is a man back here who has all those numbers. This is Mr. Robert Kane, who is the regulatory director of our association.

Senator GRAVEL. I am trying to get a figure of what the big sisters represent.

Mr. KANE. I believe that "small" as defined by EPAA, is refiners of less than 175,000 barrels per day of refined capacity; small refiners represent about 21 percent of the Nation's total. APRA represents a subset of these small refiners, those under 50,000 barrels per day of refining capacity.

Senator GRAVEL. So, 79 percent—

Mr. STEENBERG. Large independents are Ashland—

Senator GRAVEL. They are not in the 21, are they?

Mr. STEENBERG. There are three segments: integrated and large, those that are large but do not have their own crude supply, and those that are small.

These three segments constitute 65.6, 13.3 and 21.1 percent, respectively, of the Nation's refining capacity. Firms such as Exxon, Shell, and Mobil are considered integrated majors, while Ashland, Coastal States, and Amerada Hess are large independents. The small segment includes some 155 companies ranging from Rancho Refining at 920 barrels per day to Murphy Oil at 137,900 barrels per day.

Small refiners have one central problem against which all major policy proposals which affect them must be measured: That problem is obtaining equitable access to crude oil at competitive prices.

This problem has been present for well over 20 years and has been at the core of every important Federal policy and program affecting small refiners. The continuing Federal policy aimed at helping small refiners achieve equitable access to crude oil has manifested itself at various times as: the mandatory oil import program; the Federal royalty oil program; the mandatory crude oil allocation (entitlements) program; the supplier/purchaser freeze rule; and the crude oil buy/sell program.

Changes in world crude oil markets and changes in the Government's posture toward the refining industry, especially the domestic refining industry, have rendered these programs outdated or ineffective in dealing with equitable crude access for small refiners. New vehicles are urgently needed to continue the successful operation of the

Government's policy toward the crude access problem. Should the industry and the Government fail to adequately address this problem, small refiners simply could not continue to exist.

It is our opinion that the administration's proposal for decontrol not only fails to address this problem but also will actually operate to make the problem worse, to the detriment of our segment of the industry.

Against the backdrop of today's energy situation, it is not hard to understand the consequences to this Nation of placing over 10 percent of this Nation's refining capacity at a severe economic disadvantage; therefore, our association must stand in opposition to the administration's proposal for decontrol.

At our recent annual meeting we adopted the following policy statement:

The association's position shall be against present decontrol as offered by the administration, since the President's program makes no provision for ongoing access to crude supplies at equitable prices.

Small refiners do not have access to crude oil at competitive prices today. They pay a significantly higher price for a barrel of crude landed in their refineries than a major oil company pays for an equivalent barrel.

The administration's proposal for decontrol will correct none of the circumstances which lead to this situation and will, in practice, operate to raise both the absolute and relative price of crude oil to small refiners without improving their access or supply.

If there is to be a healthy, competitive small refining industry, the Federal Government must continue its policy of more than 20 years' standing, to recognize and offset the small refiner's crude oil cost disadvantage which exists as a structural defect of today's refining industry.

Tax legislation can and should be a central element in this policy.

One appropriate vehicle for the achievement of this policy objective is an import fee placed upon imported petroleum products.

We understand that Senator Bennett Johnston's Refinery Policy bill, which is scheduled for introduction soon, contains provisions for such fees with a portion of the proceeds earmarked for an offset to the small refiners' competitive disadvantage. As Senator Johnston told our association during his keynote speech at our annual meeting in early June, an import fee not only will serve as a funding vehicle for Government programs toward small refiners but it also will provide the entire domestic refining industry with some protection against foreign competitors whose operating expenses do not include the cost of such regulatory agencies as DOE, DOI, DOT, EPA and OSHA, as well as the expense of the Jones Act.

We understand that portions of Senator Johnston's bill will come before the Finance Committee once it is introduced, and we offer our enthusiastic support for the passage of a fee at levels to assure the legislation's effectiveness.

We would also suggest and support a program of special tax credits which would promote investments by small refiners, made to meet our national energy needs. These incentives would be similar to the refundable energy credits provided in last year's tax bill. They would be made available to small refiners making investments in such things as

refinery reconfiguration, especially the building of facilities to process heavy, high sulfur content crude oils; downstream processing, such as the facilities to crack heavy products or to produce high-octane gasoline components; fuel oil desulfurization facilities; or unleaded gasoline production facilities.

Perhaps even more importantly, a tax credit program could be used to forge a partnership between the Government and the small refining industry for the rapid and effective development of synthetic and unconventional fuels as substitutes for foreign crude.

Credits should be offered to small refiners which make hard commitments to process high-priced synthetic fuels or other Government-subsidized oil production. The modest size, the simple and efficient organization, and the innovative spirit of small refiners make them ideal candidates for development of these fuel sources, particularly since so many smaller plants are located near the sources of these synthetic crudes.

Such products could include not only well-publicized sources such as shale oil and liquids from coal extraction, but also less exotic sources like spent lubricating oil and other waste oils. Waste oil re-refining provides a good example of how a Government/small refiner partnership based upon tax credits would work.

Many small refiners have investigated waste oil re-refining in recent years but have found the venture unattractive because the volumes of waste oil available are not large enough. Refundable tax credit incentives for waste oil gathering operations and processing operations could result in the participation of more small refiners in this business which, in turn, will result in a reduction in improper waste oil disposal into the environment.

Our association also understands that the administration has sought the authority in the trade agreement to impose some sort of auction system upon the international crude oil market. As small and independent refiners, we have serious reservations about such a system, since we lack the financial clout to compete at auction with the major international oil companies.

Should such an auction system be imposed, it must include a small business set-aside, or other accepted means, to assure equitable access to crude oil for small business refiners.

Although our association has been in existence for nearly 20 years, this is our first serious venture into the arena of taxing policy and tax legislation. We are eager to work with the Finance Committee and its staff in the development of programs which will help our segment of the refining industry discharge its obligations to the energy needs of this country.

Toward that end, we place our association staff and our membership at the committee's disposal to help in any way they can.

I was formally brought up here as a team with a gentleman who precede me. I think it is fair to him and to me to say that the views I have expressed certainly cannot be forced upon him, nor the opinions he expressed upon me. We are two divergent entities who had not met before right now.

Senator GRAVEL. The only reason you were brought together is that you both have airplanes to catch. There is no other tie intended in any way.

Could you secure your record of profits for the small refiners in the last 10 years, annual records of profits?

Mr. STEENBERG. We could secure it, if we obtained an attorney or accounting firm who would agree to act as a confidential recipient of financial information. The information could be sent to him and an assurance of confidentiality. He could then publish the material in aggregate and we would have to urge and hope for participation among our membership.

Anything contrary to that gets us in trouble with the Justice Department.

We have done so for a couple of periods. We took a financial survey for the period of 6 or 9 months in the beginning of 1978, and that survey we can certainly make available to you right away.

We also had a study done by the Bonner & Moore consulting firm out of Houston, which looked at the comparison between rate of return by industry segment in the petroleum refining sector, and we could make that report available to you immediately.

Senator GRAVEL. Why don't you make that report available?

I don't want to get into confidential information and be responsible for retaining it. We had a charge by one of the witnesses, who was a very good witness, and I don't know how accurate he was in this area, but he attributed a lot of the problems today, right now, to some excess profits in the refinery business. Whether it is small or major, he didn't say, but I think you people ought to have an opportunity to defend yourselves.

If you can get whatever reports you have that show what you are making, an industry composite of what you are making annually for the last 10 years, it might be very valuable to the committee.

In the absence of your organization doing that, then the charge rests that you are ripping it off, and it is tough to come here and get sympathy from us if you are doing very well.

Mr. STEENBERG. We have a problem in telling people that we are not members of an industry which contains only one kind of company. That is why I opened my testimony the way I did.

Senator GRAVEL. I am very knowledgeable in that area. I have been for a number of years. So, when I hear a responsible person make a charge like that, I want to give you people an opportunity to defend yourselves, to see that justice is done.

So we look forward to your amended testimony covering the profitability for at least a decade, so that we can make a comparison.

Mr. STEENBERG. Yes, sir.

Senator GRAVEL. Thank you very much. We appreciate your appearance.

Mr. STEENBERG. Thank you.

Our next witness is Robert Brandon.

#### **STATEMENT OF ROBERT M. BRANDON, WASHINGTON DIRECTOR, CITIZEN/LABOR ENERGY COALITION, WASHINGTON, D.C.**

Mr. BRANDON. I will try to be brief. We have a lot more witnesses.

Senator GRAVEL. I assure you I will be reading all these statements.

Mr. BRANDON. I have a full statement which I would like to have included in the record.

My name is Robert M. Brandon. I am Washington director of the Citizen/Labor Energy Coalition.

The Citizen/Labor Energy Coalition is an organization of over 100 unions, citizen groups, public interest groups, senior citizen organizations, church groups, minority organizations, and others working together toward a more rational energy policy, one that truly meets the needs of the American people.

I would like to focus on a particular part of the discussion that I have heard this afternoon.

There seems to be tremendous misunderstanding around the whole debate around energy prices and decontrol. Somehow the proponents of decontrol have ignored the fact that, but for the historic quirk of the OPEC oil cartel, we would not necessarily be talking about the necessity of pegging our domestic energy supply to \$20 oil, OPEC oil.

We may very well have been here, if OPEC had taken a different course, discussing how we needed to take price controls off energy in order to get the price of oil up to \$10 a barrel or \$12 a barrel, or \$6 a barrel. The point is that, in the debate on decontrol, the producers, the proponents of decontrol, and particularly the proponents of decontrol without recapture of taxes have tried to make the case that the costs of finding energy in this country have kept pace with the OPEC prices. That is simply untrue.

The OPEC price increases have nothing to do with the cost of producing energy in this country, particularly when we talk about already known supplies of oil and gas; which is, after all, what we are talking about when we talk about decontrol.

I would like to focus on the true cost picture.

According to statistics filed by the oil industry with the Securities and Exchange Commission in their annual reports, in their 10K forms, the average cost of production for a barrel of domestic crude oil in 1978 was \$1.83 a barrel. The average price received by the oil companies was \$8.94 a barrel. The point is that the cost of production has nothing to do with the OPEC price increases.

Senator GRAVEL. Could you repeat those figures?

Mr. BRANDON. \$1.83 is the average cost of production; \$8.94 is the average selling price.

As you know, the average selling price has gone up faster than inflation, and with phased decontrol it will rise still further.

Senator GRAVEL. Your source for these figures?

Mr. BRANDON. The Securities and Exchange Commission filings, the form 10K's. I have appended to my testimony, in the back, a list of most of the major companies and the figures contained in statements that they file.

The domestic producers argue that they should be receiving the same prices that foreign producers receive. In fact, Mobil Oil took out an ad to that effect in the newspapers around the country. Again, the mistake here is that, when we talk about OPEC prices, we have not talked about their composition. The composition of those prices is 80 to 90 to 95 percent made up of excise and royalty taxes paid directly to the sovereign nations who own the oil.

If you would look on page 3 of my testimony, I have constructed an example where we can compare the actual net to oil companies, both for foreign production and domestic production. You will see that under foreign, OPEC prices, domestic oil companies who operate in, let us say Saudi Arabia, receive a net on a \$15 posted price barrel of oil of approximately 66 cents; whereas, for domestic crude oil,

taking an average price of \$9.40 and working through the numbers, the net profit is \$3.82.

The point here, again, is that the proponents of decontrol embrace the reality of OPEC prices, while ignoring the reality of producer revenues. We are really talking in this situation of taking oil that has been found and profitably produced as early as 1972, at that time, for \$3.50 a barrel; it now receives \$6 a barrel. Then, adding at least \$12 a barrel to that for the same, exact production level as would have been the case at \$6 and for oil discovered between 1972 and the present, taking the average price received there of \$13 and adding gratuitously \$5 a barrel or at whatever the OPEC countries decide to peak the price. There will be a price increase coming up later this week in Geneva, and I expect by the end of the year we may see oil prices between \$23 and \$25 a barrel; it could go that high.

All of that will inure to the benefit of domestic oil producers for producing not one drop of additional oil.

When we talk about decontrol, we are talking about decontrolling already discovered oil. The oil that is newly discovered received the world price, or close to the world price. Hard-to-get oil, Alaskan oil, also receives that high price.

So it seems to me that, in fact, rather than arguing for decontrol, the best incentive we have is the differential in price that controls now bring, so that there is a real incentive reward at the high end of prices for newly discovered and hard-to-get oil; and for the already known reserves there will be a scheduled increase of prices under the existing price controls. That would certainly be our position.

In fact, to remove the price controls for domestic wells you are really talking about removing the price controls on domestic development wells, and you are going to make them the most profitable form of energy investment, so that a company, when it has a choice of where to put its money, is going to decide to pump out the already known reserves, rather than explore the riskier oil, since they are going to receive the same price either way. That has been borne out by studies that have been done for the Department of Energy, which indicate—and the Department of Energy themselves and Secretary Schlesinger have admitted—that the new production they forecast under decontrol is almost entirely due to increased production of already known reserves.

Senator GRAVEL. Are you aware that the State of Alaska and the State of Texas and many other States regulate what a field is pumped at, and not the oil companies?

Mr. BRANDON. Yes.

Senator GRAVEL. That would mean, then, that these people would be violating State laws. They may drill all the holes they want, but we are the ones that determine, based on technical evidence, the rate at which they are going to pump that field.

The statement you are just making—I agree that is where a lot of money for the new production will come from, from finding new ways to get more recoverable reserves.

Mr. BRANDON. The point I am trying to make is that most of the production is going to come from pumping already existing, discovered and easily obtainable crude oil. When you are talking about going back into those fields—

Senator GRAVEL. They have to spend more money doing that.

Mr. BRANDON. Yes; they are going to spend more. In many places they don't have the requirements of the Texas Railroad Commission, but keep in mind that production has been speeded up. There is irresistible political pressure and economic pressure for State officials to allow as much production as is necessary.

Senator GRAVEL. I should correct you on that. I don't know about the Texas problem; I know Alaska. They have zero influence in that regard. It is a technical decision made by our geologist who works for the State government as to what that is going to be. The gentleman, who happens to be a commissioner, is a Ph. D., unrelated to the oil companies, probably like yours; in fact, I would say probably has a lot of your persuasion.

I don't think he is influenced very much by what the companies tell him. He is the one who dictates what that will be, based on scientific information.

Mr. BRANDON. We already have price incentives for Alaskan oil. In Texas, I don't think you will find people drilling and finding new reserves. That is the new issue here, that the money that is going to be used by the oil companies won't necessarily be used for drilling for new reserves in Texas; it will be for developmental drilling wherever they can. It will also be used for diversification, as was mentioned earlier.

Senator GRAVEL. Most of the drilling activity in Texas and the West is primarily by independents, not by the majors.

Mr. BRANDON. Most of the production that is going to come on-stream under decontrol is going to be controlled by the majors. I don't think that really is the point here.

If the independents are going out exploring for oil, they will receive their world price for oil under existing controls, unless we decide—and I think we should—to cap that high price. I think that is incentive enough. Beyond that, I am not sure that we want to simply peg those price increases to the OPEC rises in the future.

The fact of the matter is that most of the drilling that is occurring now is developmental in nature. The independents do most of the exploratory drilling, but they find that they are involved with very little of the new production. They may find the new supplies and then sell them to the major oil companies. Most of the additional production from this decontrol proposal, however, is going to come from pumping already existing fields. Most of that oil is controlled by the majors.

I would like to continue.

The other point that has been ignored in this debate, I think, and it is significant, is the impact of decontrol on the economy and on the family budgets, on the American pocketbook.

Not only would the decontrol plan increase energy costs by at least \$85 billion by 1985, and increase inflation by at least 1 percent, it will also exacerbate alarming rates of inflation increases in specific energy areas. Energy right now in the last 4 months has been reaching a 32-percent annual rate of increase. Electricity is up almost as much. There are reports that heating oil this winter is going to reach in many cases close to \$1 a gallon, up from 60 cents on an average last winter. Many people simply cannot afford the higher cost of energy and the higher cost of decontrol.



There are almost 15 million people in this country at 125 percent of the poverty level or below. Many of those families will be compensated by any kind of program you might put together to try to cushion the effects of decontrol.

As you are well aware, Senator, because the Finance Committee is involved in many other supplemental income programs, it is very difficult to reach many of those people. The supplemental security income program has a substantial problem in reaching people. Statistics on rebate proposals show that many, many poor and elderly don't receive the cash rebates that are planned under these kinds of proposals.

Senator GRAVEL. Why is that? It is the Government that is controlling.

Mr. BRANDON. It is precisely because we are trying to, first raise the price of energy and then deliver additional cash to these people that makes it impossible to do.

Senator GRAVEL. You mean it is impossible for the Government to pass a law to help those people?

Mr. BRANDON. That is right. The only recourse I would suggest there is that we have to keep the energy within their budget to begin with.

Senator GRAVEL. Are you saying the Government, which can't deliver the other, should go ahead and manage the energy problem?

Mr. BRANDON. I don't suggest that they manage it at all. I suggest that we don't simply turn over the price control mechanism to the OPEC cartel. You have several choices: You can lift the price of oil and give the U.S. producers whatever the OPEC cartel decides to charge. And I would suggest there that in fact you would be endorsing the windfall profits that the President has talked about, because they are, in fact, simply windfalls. It was not expected by any of the people who were making investments in the energy industry 3 or 4 or 5 years ago, that OPEC would suddenly move the price of oil from 50 cents a barrel up to \$20 a barrel.

The other choice is, you could raise that price to that level and tax that money away and return it to consumers in a per capita rebate. That was the proposal under the crude oil equalization tax.

What happened there was that most of that money was going to be carved out for the energy industry. In that case, the proposals before Congress now on the windfall profits tax don't talk about carving out the money for the industry but simply putting a tax on it at something less than 100 percent.

In the case of the President's proposal, an effective rate of 10 percent; in the case of the Ways and Means proposal, a 70-percent statutory rate on old oil and a less than 50-percent rate on new oil, on the increases from this year's price levels up to whatever, again, OPEC decides to charge.

What are we going to get with the decontrol? We talk about how we need more supplies and we have to curb consumption. I think that we are talking about a very bad bargain when we talk about \$85 billion. It is no different than deciding we are going to place an \$85 billion tax on energy in this country and then tell the American public that somehow we are going to get them out of the energy problem. It is a bad bargain because if we are looking for an incremental amount of additional supply and we have to pay an additional price for every single barrel that is produced, both before and after we get the increase in supply, the incremental cost of those barrels is staggering.

The Energy Department figures that there will be at least \$150 a barrel for each barrel of OPEC oil we back out of the impact cycle. Senator GRAVEL. Say that again.

Mr. BRANDON. For each barrel of oil that we eliminate as import, we are going to be paying under the decontrol proposal \$150 a barrel.

Senator GRAVEL. How are we going to do this?

Mr. BRANDON. It is the incremental cost when you figure out the total cost that we are going to be paying in addition for every barrel that is produced, and the additional amount that is going to be supplied as a result of decontrol.

If you figure out the incremental cost of that additional amount of production, in this case 2 or 3 percent, it comes out to about \$150 a barrel. You have that in my testimony.

Senator GRAVEL. You have broken it out on the chart on page 3?

Mr. BRANDON. No. It is in the testimony. I will be happy to submit additional information on it.

Senator GRAVEL. I will be happy to get it.

Mr. BRANDON. The point is, for that \$150 we could do a lot of other things in terms of encouraging either alternative supplies of energy or conservation. We don't seem to talk about the massive expenditures we could have for conservation, and for alternative energies. Rather, we simply talk about the massive additional expenditures that we are asking the American public to make by paying this additional price on oil and hoping that the oil companies will somehow find the additional oil, make the additional investments and the right kinds of decisions and get us out of the problem.

I think it is a bad bargain; it won't create a lot of new production; it will increase profits enormously; it ignores the fact—as I mentioned—that every other industrialized nation, when they talk about high energy prices, recoups that money for the Government involved, not for the industry involved.

You had testimony earlier today about \$2-a-gallon gasoline in Europe. That gas is \$2 not because it goes to the domestic energy industry but because there is a Government-imposed tax on gasoline.

A further point on conservation. The decontrol proposal will lead to a small level of conservation, somewhere in the range of 1.2 to 1.7 percent of demand by 1985, or about 250,000 to 300,000 barrels a day.

By contrast, we can receive the same level of conservation if we have a mandatory thermostat setting in public buildings and commercial buildings which could save up to 390,000 barrels a day of oil. Strict enforcement of the 55-mile-an-hour speed limit would save 200,000 barrels of oil a day. Requiring wheeling of power between utility companies in order to share the load at peak times could save about 200,000 barrels of oil a day. All of that at no additional cost to the economy.

I would suggest then that decontrol is a bad bargain in terms of conservation.

Senator GRAVEL. Wouldn't you consider having to police the highways to be more expensive and an additional cost in that regard?

Mr. BRANDON. Yes; but it won't be a large amount relative to the gasoline savings.

Senator GRAVEL. But there would be a slight increase?

Mr. BRANDON. The thermostat setting assumes a certain level of compliance.

Senator GRAVEL. I think it is unreasonable to assume that everyone is going to want to suffer at 80 degrees.

Mr. BRANDON. However, if I ran a department store and had an opportunity to cut my energy costs by keeping the thermostat at 80 degrees, I would do it, and tell the customers I am obeying the law.

Senator GRAVEL. The customer will go next door, where they don't want to do that.

Mr. BRANDON. My point is that the estimates that are made here on conservation have been done by DOE, assuming a level of compliance substantially below full compliance.

Let me just say, in addition, we had some testimony about the profitability of the oil industry. The important point on the profitability is for us to begin to look at the rate of return on equity for oil companies, given the present price levels in the industry, since we know they are going nowhere but up. The present rate of return on equity is, in fact, greater than the manufacturing average. I have statistics in my testimony on that. There is also very clearly going to be substantial increases in rate of return on equity as a result of decontrol.

Senator GRAVEL. Are these Government statistics?

Mr. BRANDON. These are from companies' annual reports.

Senator GRAVEL. You are stating that over the last 10 years—

Mr. BRANDON. Not over the last 10 years.

Senator GRAVEL. What are you referring to then?

Mr. BRANDON. 1978 and the first quarter of 1979.

Senator GRAVEL. A year and a quarter?

Mr. BRANDON. That is correct. It is the most important year and a quarter, when we are debating the merits of whether or not energy prices should go further; just as you don't want to limit the look to 1 year, you have to keep in mind that to look back at 1972 and 1973 when prices were lower, is also distorting the picture.

The point is that we are talking about investment now, where investment is going to be made and whether or not it is profitable to get involved in energy investment. We have to look at a rate of return on current energy investment which is above the industry average. They will continue to go up.

If you read the investment journals, you will find the energy stocks are on the rise; they certainly promise to give greater return in the future.

Let me add that if there is going to be a windfall profits tax, our view is that it should tax away the windfalls, that it should not allow for additional revenues to U.S. producers simply because of the historic quirk of the OPEC price cartel. Therefore, a tax that approaches 100 percent on the difference between the control price now—which has been adjusted upward for inflation plus 3 percent, plus an additional bonus because of the decline curve being much greater than the natural decline of old oil—that all of that difference be taxed away to the world price. If that is what you want to do, to bring the price up to the world level, to encourage competing sources of new energy, and new oil exploration, that oil should be taxed substantially, on anything above the present level of oil prices, which we feel are more than adequate. When you look at the return on equity, you will find that the additional increases due to the OPEC

cartel again be taxed away substantially to keep the price high—if that is the way the Congress is going to go—but not to let that money simply inure to the benefit of the industry.

Right now, every one of the major oil companies is saying they are swimming in cash, and that they are diversifying primarily because they don't have enough opportunities in the energy development area that they care to take advantage of right now.

It is not the profitability question; they are getting involved in drilling at record levels. In fact, they are probably as involved in oil as much as they can be right now. If we gave them a certain price structure on their already discovered reserves, that would go out definitely in the future, then they would have certainty about that production and they would know how to react to it.

If we gave them a high price for their new discoveries, they would have an incentive to go out and look at that high world price. There would also be incentive to find new sources of energy.

So, in conclusion, I would say that when you strip away the subterfuge of the OPEC price as some rational base in the price of producing domestic oil, the decontrol debate is not about needing the additional revenues for the oil industry. They have plenty of cash. It is not about creating new incentives for oil discoveries.

The present differential between old oil and new oil will do that. Raising prices and conservation will not help poor families that will have to adjust as much as they can, and people who have to drive to work. We think that letting the oil companies be the collection agent for this new \$85 billion independence project is the wrong way to go. You will be swamped with proposals in this Congress in the future to fund all sorts of alternative energies. I am sure that the Congress is going to decide to spend Federal dollars on that. It seems to me that is the better way to go than to turn it over to the industry.

We should do like every other major industrialized nation and recoup the great bulk of the additional high prices—as the OPEC cartel does for their own uses—and return it to the public in the form of lower social security taxes, energy reinvestment, and many other uses. There is no direct link between high prices and greater production, but there is clearly a link between higher energy prices and the adverse effects on the economy and the adverse effects on the American families' pocketbooks.

In conclusion, I would urge that we should continue controls; in fact, there is really no decontrol issue so far as I am concerned. The only issue is who will control oil prices here, the United States, or the OPEC cartel in concert with the oil industry.

Senator GRAVEL. I would like to ask one question, because the hour is late. The period that you said you took your figures from—1978 and the first quarter of 1979—I am sure a lot of the data you have in here is probably relative to the last 5 years of oil company performance, and certainly you are against an increase.

Since 1971, both oil and gas have been regulated so that the high price that we suffer from today is the product of Government management. The decline which has taken place from 1971 to today has been somewhere around 80 percent self-sufficiency, 75 to 80 percent self-sufficiency. That is the track record of what you are suggesting we continue doing?

Mr. BRANDON. You can't have it both ways. If you also look at the high-price strategy, energy prices have gone up substantially in the United States and reserves have gone down. You can't make the argument that there is a direct relationship between higher prices and more production.

I would say, in fact, higher prices will bring some marginal, more production, but it is the higher prices on the new production you want to encourage.

Senator GRAVEL. That is what we are doing right now in 1979; that is what we have. We have upper tier.

Mr. BRANDON. And exploratory drilling is at an all-time high. We are not finding the reserves for lots of other reasons. Drilling is up. One reason we are not finding new reserves is because 90 percent of the drilling that takes place today is developmental drilling certainly by the majors.

Senator GRAVEL. Do you know why that happens? I am assuming you know.

Mr. BRANDON. Among other things, they want to maximize their profit margin.

Senator GRAVEL. If you have had a minor that discovers oil and sinks one or two oil wells, he gets an appraisal and sells what he has to the majors; then the majors will have to come in and put 20 wells and gathering lines to take the oil out to the refinery. The major's discovery has one well, has a positioning well. Even now, with the production that is in the pipeline, they have to spend \$12 billion sinking more wells to get all that oil out of what they have defined.

So your statement that it is all production wells—of course you go to production wells after you discover the oil. I don't get your point. You have repeated that statement several times, that 90 percent of it is in production wells, that is how you get the oil out?

Mr. BRANDON. The companies claim they will engage in additional exploration in finding of new oil resources with the additional capital from decontrol, and I am saying that is not the track record and that is not the anticipation in the future.

Senator GRAVEL. I don't know who is telling you that, but I will tell you this: In a discovered field already in operation, like Prudhoe Bay that is already there, to get the oil that they project out in the reserves, they are going to have to spend an additional \$12 billion. The pipeline already has cost \$8 billion. I am sure that other fields are just like Alaska.

Mr. BRANDON. It is like any other industry, they have to spend money to make money; they make quite substantial amounts of money.

I would argue with you. Among other things, the profitability of the oil industry has doubled in the last 6 years. You may want to argue that they were way below where they should have been back before the embargo.

Senator GRAVEL. What would your base be? What is the base that was doubled? Were they making 10 percent?

Mr. BRANDON. That is right.

Senator GRAVEL. They are making 20 percent now?

Mr. BRANDON. That is right. The rate of return of many independents is higher because if you isolate production alone, which is the most profitable part of the industry, oil production, and you don't

integrate the operations, you will find that return on equity is even much higher.

Senator GRAVEL. I will take that for the record. I think that Time magazine and a few other journals that have not been terribly biased are probably in error by your standards.

On page 3, you are making that representation, that \$3.82 is the net profit on a barrel of oil that they are receiving domestically; is that today? How long has that been for? Have they been doing that for a number of years to us?

Mr. BRANDON. No; that is today's prices.

Senator GRAVEL. What do you think it was 2 years ago, the same thing?

Mr. BRANDON. It would have been approximately, certainly the same percentage basis.

Senator GRAVEL. Why don't you submit for the record what you think it has been for the last 5 years, by year?

Mr. BRANDON. Probably the more important figure is to look at the next 5 also; but I will be happy to do both.

Senator GRAVEL. We don't know what the next 5 will be.

I would like to see what it has been since we do know what has happened. What is going to happen is conjecture, whether it is deregulated or not.

Mr. BRANDON. We certainly know even under existing price controls the average price of domestic crude oil will be going up at more than 10 percent a year under controls.

Senator GRAVEL. That is one-third of the profit. If \$9.40 is what you are selling for, \$3.82 is more than a third. You mean to tell me the Federal Government has been letting that happen?

Mr. BRANDON. I guess I am.

Senator GRAVEL. You mean that Jimmy Carter and Schlesinger and these people who have been for regulation have sat here and let the people make a third? I assume you are talking about the composite industry where that has really happened?

Mr. BRANDON. This is an example of what happened with the \$9.40 per barrel of oil with average lifting cost and additional cost of royalties and taxes under the existing system.

Senator GRAVEL. The example means what it says: It is net profits to oil producers. You can say it is an example, but you have to assume that the average of all the producers—

Mr. BRANDON. I am saying the average is 20 percent; it is probably actually higher than that for production alone; it probably approaches close to the 33 percent.

If you take a look at rate of return of some of the major, non-integrated independents, you will find Houston Oil & Minerals' rate of return is substantially higher than the 20 percent, 30 percent, and in many cases it has gone as high as 33 and 34 percent.

Senator GRAVEL. I would be happy to keep the record open for anything you wish to add. If you can fulfill the request we have made of you, I would appreciate it. It helps in the dialog.

Mr. BRANDON. Very well.

[The prepared statement of Mr. Brandon and the material requested follow:]

STATEMENT OF ROBERT M. BRANDON, WASHINGTON DIRECTOR, THE CITIZEN/  
LABOR ENERGY COALITION

SUMMARY OF PRINCIPAL POINTS

The Citizen/Labor Energy Coalition believes:

- (1) Price controls should be extended on crude oil prices.
- (2) That there is no rational relationship between OPEC cartel price levels and prices domestic producers should receive for oil. In fact, foreign sovereign nations extract most of the per barrel revenues from producers in the form of royalties and excise taxes.
- (3) If the U.S. wanted to operate with the "reality" of OPEC prices, it should impose a severance tax of 80 to 90 percent, as all OPEC nations do.
- (4) The present system of price controls already rewards new discoveries by providing a differential in price between known reserves and newly discovered or hard-to-recover oil.
- (5) Decontrol will be highly inflationary—costing between \$85 and \$100 billion by 1985, adding 1 percent to the cost of living, and adding to an energy inflation rate already at 32 percent annual. It will increase an average family's energy bill by as much as \$300 and fall particularly heavily on the poor and elderly, many of whom already spend one-third of their income for energy.
- (6) Decontrol is a staggeringly expensive jolt to our pocketbooks that will have marginal effects on increasing oil supplies and promoting conservation. Under decontrol, production will increase about 2 to 2½ percent while demand will decrease 1.2 to 1.7 percent. At the same time oil industry after tax profits will jump by more than 30 percent.
- (7) If Congress is to raise prices to world levels it should adopt a 100 percent tax on the windfalls from OPEC cartel-induced price increases that benefit U.S. oil companies.
- (8) Since any windfall tax is deductible for income tax purposes, a high rate of tax is essential for any meaningful windfall tax. Therefore, the Ways and Means tax proposal should be strengthened, with the rate increased and applied to all increases due to OPEC action.
- (9) The real answer to windfall profits is not to create the windfalls in the first place. A windfall tax, therefore, only becomes an excuse for decontrol—a step that is unnecessary and extremely burdensome on the American public.
- (10) There is no real decontrol issue. The only issue is who will control oil prices—government officials accountable to the public, or the OPEC oil cartel in concert with the major oil companies—accountable clearly to no one.

INTRODUCTION

My name is Robert M. Brandon. I am Washington Director of the Citizen/Labor Energy Coalition. The Citizen/Labor Energy Coalition is an organization of over 100 unions, citizen groups, public interest groups, senior citizen organizations, church groups, minority organizations, and others working together toward a more rational energy policy—one that truly meets the needs of the American people.

I would like to thank the Committee for the opportunity to testify on oil price decontrol and its relationship to a windfall profits tax.

The last time I testified, specifically about these two issues, was in February of 1974. At that time, the Ford Administration was proposing a windfall profits tax on oil receiving more than \$7 a barrel. They argued that "it would be unfair for U.S. producers to be advantaged, while their fellow citizens are making the sacrifices required, be retaining excessive prices from the abnormally high prices' caused by the Arab Boycott and attendant price rises.

Back then, the oil embargo and OPEC price actions had raised oil prices from around \$3.50 a barrel to \$6.50 a barrel with new oil selling at \$8 or \$9 a barrel. The Ford Administration argued that \$7 would be "a long term supply price"—that in three years, by 1977 or 1978, that price would be sufficient to ensure vastly increased U.S. production.

Not surprisingly, U.S. oil companies argued that any new tax on revenues gained on oil selling for above the \$7 price would be disastrous for the country and the companies. Ironically, scarcely two years earlier, these same companies argued that price controls freezing crude oil prices at August 1971 levels would be disastrous for the country and the companies. The difference was that in 1971 they argued a "free market price" of \$6 or \$7 would bring on plenty of additional supplies. Now the companies are arguing that oil discovered at \$3.50 a barrel and

sold presently at \$6 a barrel, as well as released "old oil" or newly discovered oil selling at around \$13 a barrel is not enough incentive to produce adequate supplies. Continued price controls, they say, would be disastrous to the country and the companies. They even argue that \$17 is not enough—arguing against any new taxes on that price. I'm beginning to have a feeling of *deja vu*.

The debate on oil prices has always been one-sided—with oil companies arguing they need higher and higher prices to remain profitable. They would like us to believe that costs somehow keep up with OPEC price increases and the industry is, therefore, deserving of OPEC cartel prices. This argument is flim-flam, plain, and simple. Let's look at the true picture.

#### WHAT ARE THE TRUE COSTS OF PRODUCTION?

According to the industries' own information filed with The Securities and Exchange Commission, 1978 average, per barrel, production costs for 16 major oil companies was \$1.83 per barrel. These same companies received average price for those same barrels of \$8.94 per barrel. (See attachment.)

The flim-flam continues with the argument that all the companies want is to be treated the same as foreign producers, receiving the same price for their oil. This ignores the fact that many of them are the foreign producers, but that's not the point. The fact is that foreign sovereign nations extract most of the per barrel revenues from producers in the form of royalties and excise taxes disguised as "income taxes." This can be illustrated with the following examples.

#### *Net profits to oil producers for Saudi Arabian crude oil*

Selling price (posted price is \$15.63) .....	\$14.54
Lifting cost .....	-.40
Royalty (20 percent of posted price of \$15.63) .....	-3.13
<hr/>	
Taxable revenues .....	11.01
"Income" tax (85 percent) .....	-9.36
<hr/>	
After tax income—from production .....	1.65
Participation profit from Aramco interest of Saudi Arabia (60 percent) ..	-.99
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Net profit to oil companies .....	.66
Revenue net of cost .....	14.14
<hr/>	
Share for Saudi Arabia (95 percent) .....	13.48
Share to oil company (5 percent) .....	.66
Revenue (net of cost) .....	14.14
<hr/>	
Share to Government (88 percent) .....	12.49
Share to producers (including Saudi interest in Aramco—12 percent) .....	1.65

#### *Net profits to oil producers for domestic crude oil*

Average domestic price .....	\$9.40
Lifting cost <sup>1</sup> .....	-3.00
<hr/>	
Net revenues .....	6.40
State severance and income tax (7 percent) .....	-.45
Royalties (12.5 percent) <sup>2</sup> .....	-1.18
<hr/>	
Taxable income .....	4.77
Federal income tax (20 percent) .....	-.95
<hr/>	
Net profit .....	3.82
Revenue net of cost and royalties to private sector .....	5.22
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Share for Government (Federal and State—27 percent) .....	1.40
Share to oil company (73 percent) .....	3.82

<sup>1</sup> Average cost is \$1.83. Mobil Oil states this figure understates their average costs which are nearly double that figure.

<sup>2</sup> Unlike the Saudi Arabian case, these royalties are paid to provide investors or landholders, not the Government.



If the United States operated as the OPEC Nations, and, for that matter, the British, we would be discussing the imposition of large (80 percent or more in the case of most OPEC Nations) severance taxes for the right to extract oil from the ground and profitably produce it.

Decontrol, then, attempts to embrace the "reality" of OPEC price levels while ignoring the reality of producer net revenues. Proponents use OPEC price levels as an assumed standard as if it had some rational relationship to the costs of oil production. It does not. OPEC prices have a direct relationship only to the historic "quirk" of an oil pricing cartel whose price increases have been universally denounced as excessive and economically injurious. Yet decontrol proponents want to embrace those exorbitant prices as the U.S. standard. This ignores the reality of the revenues U.S. producers will receive on U.S. oil pegged to the world price.

The President's decontrol plan merely lifts the prices on already discovered oil to whatever the OPEC cartel decides to set. Newly discovered oil, in effect, already receives the world price. Therefore, under decontrol, the oil industry and the President would like us to take a \$6 barrel of oil, already discovered and profitably produced, and add at least \$12 to the price. In addition, \$13 a barrel oil, already discovered and profitably produced, would receive a bonus of at least \$5 a barrel—simply because the OPEC Nations have raised their take on their oil.

As OPEC raises its price, and it clearly will (probably to around \$20 a barrel by the end of the year) decontrol will simply give unwarranted and unexpected windfalls to U.S. oil companies. Those unwarranted windfalls, as well as those on already discovered oil, should not be handed over to the oil companies. Continued price controls would insure that they will not. Price controls would also help stem the alarming inflation rates pushed primarily by energy prices.

Those who feel that higher energy prices are a good thing should be proposing a 100 percent windfall tax on already discovered oil and similarly high rates on future cartel mandated increases that would go to newly discovered oil under decontrol.

Ironically, a 100 percent tax to raise prices to world levels was proposed by President Carter two years ago in the form of a crude oil equalization tax. It lost support not only because of its effect on raising energy prices with a new tax, but also because attempts were made to "siphon off" large portions of the tax to be kept by the oil industry.

The Administration now has proposed a tax at only 50 percent leaving the oil companies with a substantial portion of the new revenues without even carving out a piece of the tax. They have also exempted large categories of oil from the tax.

The House Ways and Means Committee has changed the proposal to give less to the oil industry on their already discovered oil, to give more on revenue increases for newly discovered oil that occur in the future simply because of OPEC increases. It is my judgment that this committee will attempt to weaken the tax still further, leaving the oil industry with more of their unanticipated OPEC created windfall revenues.

It would be comforting to believe President Carter's assertion that 71 cents of every decontrol dollar will be taken away in taxes and royalties. The truth, however, is that little more than 30 cents on the dollar would be recouped. For the major oil companies, an average of no more than 20 cents would go to the corporate income tax, but many oil producers pay virtually no income tax at all. In addition, some of the 30 cents would go to royalty holders—often wealthy oil investors or landholders. What decontrol would do then is make drilling and developing known, already-discovered old oil supplies the most profitable form of oil production in the world. High cost exploration and development of enhanced recovery would be less profitable.

Oil companies have also distorted the debate on decontrol by ignoring the huge subsidies they are already receiving from the American taxpayer. Not including the treatment of foreign royalty payments as taxes for purposes of the foreign tax credit (a tax subsidy worth approximately \$1.5 billion a year), the domestic oil industry receives additional tax subsidies for artificial write-offs for percentage depletion and intangible drilling deductions amounting to almost \$3 billion a year. An additional \$1 billion is garnered in other tax write-offs. Ironically, the oil industry tax subsidies will increase dramatically with crude oil decontrol.

These tax subsidies result in reducing oil industry taxes from the statutory 46 percent rate to an average rate of 17 percent for major oil companies according to a recent Treasury Department study. (The tax rate for all corporations averages about 35 percent.) Again, all the data would indicate that as oil industry revenues go up, tax rates go down. For instance, in 1974 with producer revenues up 100 percent over 1973 industry tax rates actually declined one-half of one percent.

Before the Congress begins to discuss proposals for windfall profits taxes, it would do well to consider the impression of a "normal profits tax." One way to keep oil companies from reaping excess profits is to have them pay their full share of taxes on all their profits. Elimination of costly and inefficient tax subsidies would result in a rate approaching the normal 46 percent tax rate.

#### WHAT THE DECONTROL PROPOSAL WILL DO

The President has begun to remove price controls from domestic crude oil beginning June 1, 1979 with total decontrol accomplished by October 1, 1981.

"Old oil," the 36 percent of domestic oil discovered in 1972 or before, would rise to world prices (about \$17 a barrel) from its present level of under \$6 a barrel.

"Released oil," the 34 percent of domestic oil discovered after 1972, would rise to the \$17 world price from its present price of \$13 a barrel. Released oil is oil discovered before 1972, but reclassified as "new oil" because it is produced at a rate in excess of 1972 production, less a 1½ percent a month assumed "natural" decline rate.

Thirty percent of domestic oil is effectively uncontrolled and presently sells for the world price. This category includes "stripper" oil (from wells producing under 10 barrels a day) increased production due to enhanced recovery techniques, Alaskan Oil, and oil from the National Petroleum Reserve.

Seventy percent of all domestic oil is now kept below the OPEC price. Decontrol will allow more than half of this oil—that discovered and profitably marketed before 1973—to jump in price from less than \$6 a barrel to \$18 or \$19 a barrel by 1981. The rest of the already discovered oil will jump from \$13 a barrel to \$18 or \$19 a barrel.

The oil industry will receive additional revenues of between \$17 and \$20 billion by October, 1981 for producing this oil they have already discovered at exactly the same rate as they are producing it now. Total increased revenues between now and 1985 will be \$85 to \$100 billion depending on OPEC price increases.

#### WHAT IT WILL COST

Under the President's plan, the immediate additional costs to consumers is over \$17 billion between now and 1981 and for higher oil costs alone. But there will be additional burdens.

*Inflation.*—The Congressional Budget Office has indicated that the cost of living would be pushed up by about one full percentage point by 1981 as a result of the President's decontrol plan. Price rises will not be limited to gasoline, propane, and home heating oil. Other products that depend on petroleum such as fertilizer, chemicals, plastic, synthetics, etc. will also become more expensive as will everything we buy that depends on transportation to get to the marketplace.

Heating oil is projected to reach \$1 a gallon by this winter in many parts of the country. Gasoline prices have already jumped at an annual rate of 35 percent in the first quarter of this year, and in the last four months are increasing at a startling 57-percent rate. Overall energy prices have risen at a 32-percent-annual rate. This is before decontrol will trigger another round of sharp energy price increases.

*Family budgets.*—Decontrol will cost the average family of four over \$300 a year assuming no additional large OPEC price rises. In fact, American's fuel bills will rise by as much as \$600 a year when you add in the price increases in natural gas and a 10 to 15 percent rise in the price of imported oil.

*Effects on the poor.*—The average poverty family now spends \$1,100 of its meager \$3,300 annual income on energy. That figure will rise to over \$1,400 under the Carter decontrol plan—not including other energy price increases. The White House contends that the poor and elderly would get \$100 in assistance to help offset their higher costs. But this program is predicated on passage of a so-called windfall tax and with 15 million poor families, the President has only asked for enough money to give 8 million of them \$100 grants.

#### A BAD BARGAIN

The argument for "decontrol" is that it will stimulate additional domestic production of oil. But if the amount of that additional production is small in relation to total production, and if to get these few extra barrels we have to pay a much higher price for large amounts of oil that would have been produced anyway without "decontrol," then the total cost to the nation of those extra barrels will be astoundingly high.

The White House claims its decontrol plan will increase production by 400,000 barrels a day by 1981. In that year alone, consumers will be paying over \$20 billion more for oil under decontrol. The incremental cost to the economy of each additional barrel of oil would be over \$150 a barrel.

By any fair measure higher costs, greater inflation, and windfall profits will do little to reduce our dependence on imported oil.

#### MORE PROFITS, BUT LITTLE MORE PRODUCTION

Under decontrol, the White House claims oil production will increase by 660,000 barrels a day by 1985 out of production of 20 million barrels or 3 percent. The Congressional Budget Office estimates increased 1985 production of between 400,000 and 500,000 barrels a day or a 2 to 2½ percent increase. As a result of decontrol, after tax profits for the oil industry, by comparison, should increase by 30 percent by 1985.

The present system of controls already rewards new discoveries by providing a differential in price between known reserves and newly discovered or hard to recover oil. In fact, decontrol will provide an incentive to hold oil off the market rather than produce it until the world price could be fully realized by the companies. It will mean little new production, only speeded up production of known supplies. Secretary Schlesinger has admitted that most of their projected supply increase is the result of oil being pumped out of the ground a little sooner than otherwise, and not more oil being discovered. The CBO agrees, indicating the increased oil production in 1985, "a significant portion of this oil, however, would have been produced in any event; decontrol provides an incentive to produce it over the next 5 to 8 years as opposed to subsequent years."

Decontrol will actually lead to less exploration and more pumping in old fields. Since most of the decontrolled oil will be already discovered "old oil" and since most newly discovered oil and hard-to-find oil already receives the world price or close to it, there is little incentive in decontrol for exploration.

An unreleased DOE study done by ICF, Incorporated concludes that decontrol of domestic oil may actually deter oil companies from discovering new reserves as they seek to maximize profits by drilling in known reservoirs and receive the decontrolled price.

The study undercuts one of the primary arguments advanced by the Administration in favor of decontrol—that higher prices are needed to stimulate discovery of new reserves. "Is it reasonable," the ICF study asks, "to assume that an increase in the marginal oil price for new discoveries from \$4 in 1973 to \$15 in 1978 does not provide an adequate incentive, whereas adding a few dollars more would?"

In fact, between 1972 and 1978, domestic oil prices jumped 170 percent while U.S. petroleum output actually declined. Reserves during that period were down 23 percent.

#### DECONTROL WILL LEAD TO LITTLE ADDITIONAL CONSERVATION

Americans have adjusted about as much as they are going to in their use of gasoline and heating oil. Further price rises will simply create economic hardships for those least able to afford it. The fact is gasoline and heating oil demands are relatively inelastic. That is, people tend to buy it regardless of price. For example, gasoline and heating oil prices have doubled since the 1973 oil embargo, yet fuel oil consumption actually rose 17 percent and average gasoline consumption rose 16 percent.

For these reasons, no one estimates decontrol will reduce consumption by more than 250,000 to 350,000 barrels a day by 1985, a reduction of only 1.2 to 1.7 percent. Consumption by 1981 will only drop by 100,000 barrels a day.

By contrast, strict enforcement of the 55 mile an hour speed limit would save 200,000 barrels per day by 1985; mandatory thermostat settings in public and commercial buildings could save 380,000 barrels per day; and the wheeling (trading) of electricity between systems during peak demand could save 200,000 barrels. And none of these mandatory conservation measures cost anywhere near the billions of dollars decontrol will cost our economy.

#### THE WINDFALL PROFITS TAX ISSUE

We would urge that the Congress not try to partially recapture through a "windfall profits tax" what it is willing to give to the oil industry by failing to

extend price controls. As mentioned earlier, the notion that somehow we must live with "realistic" OPEC prices is a cruel hoax on the American public that has only injured to the benefit of the oil industry.

But, if Congress is to raise energy prices to world levels, then the only fair choice the Congress has would be to adopt a 100 percent tax on the difference between oil profitably produced now at \$6 and \$13 and the OPEC price with a full rebate back to consumers to make them whole for the increased costs of their limited basic energy needs. Excessive energy use would be "charged" at the higher world rates. The present windfall tax proposals simply attempts to divert much of those increased revenues to the oil industry. The public will not be fooled by the passage of a windfall tax that masks the fact that the Congress and the President could have avoided the "windfalls" in the first instance.

Only continued controls will keep that unnecessary income transfer from taking place. It is clear that any windfall tax passed by the Congress will only be a vehicle to divert those higher prices to the oil industry in the form of windfall profits. The windfall profits tax then becomes the excuse to permit the windfalls.

The President's plan illustrates this point vividly. The "windfall profits" tax will tax away little more than 10% of the \$17.6 billion windfall between now and October of 1981.

In fact, through 1985, it is estimated that the oil industry will receive a windfall of over \$85 billion of increased gross revenues from decontrol. The "windfall tax" will add only \$6.9 billion of additional taxes.

The increased tax liability of the oil industry will be about \$2 billion over their normal income taxes they would normally pay on the windfall revenues. The Administration may claim \$3.3 billion will be collected by a "windfall tax," but these revenues are tax deductible for the producers so their actual net tax increase from the "windfall tax" will be \$2.1 billion, according to White House figures.

#### IMPACT OF PROPOSED WINDFALL PROFITS TAX<sup>1</sup>

(In billions of dollars)

Year	Expected increased gross revenues from decontrol	Regular corporate income tax (20 percent)	Net tax increase from "windfall tax"
1979.....	\$1.2	\$0.2	\$0
1980.....	5.8	1.2	.5
1981.....	11.5	2.3	1.5
1982.....	14.5	2.9	1.7
1983.....	15.1	3.0	1.2
1984.....	17.7	3.5	1.1
1985.....	20.4	4.1	.9
<b>Total.....</b>	<b>86.2</b>	<b>17.2</b>	<b>6.9</b>

<sup>1</sup> Prepared by the Citizen/Labor Energy Coalition (data on increased revenue and windfall tax by Department of Treasury).

Forty percent of oil production is exempt from the "windfall tax." In fact, in October, 1981, seventy-seven percent of all old oil—where the greatest windfall occurs—will be excluded from the "windfall tax" base.

#### THE WAYS AND MEANS COMMITTEE WINDFALL TAX PROPOSAL

The House Ways and Means Committee has increased the windfall tax on already discovered oil by eliminating many of the exemptions proposed by the Administration and by raising the statutory rate to 70 percent. But it must be kept in mind that any additional windfall tax is deductible and therefore further reduces the federal income tax. That is why there have been efforts to raise the tax to 85 percent. Frankly, the correct level should be 100 percent since the increases are pure windfall.

Under controls, there already exists adjustments for inflation, a 3-percent bonus, and an accelerated decline curve all working to increase revenues on already discovered oil. Revenues above this level should be taxed away totally.

On newly discovered oil, the Ways and Means Committee actually weakened the windfall tax bite. On this oil, again, the recipient of unanticipated and gratuitous future price increases through the actions of the OPEC cartel—the tax rate remains

at 50 percent for price increases above \$16. Theoretically, oil that sells for above \$26 would be subject to a higher 70-percent tax on the excess. But the \$16 base level and the \$26 higher tax trigger level are adjusted upward for inflation, plus a 2-percent bonus. That bonus will begin to exempt more and more of the OPEC induced windfalls from the windfall tax and should be eliminated.

The undeniable fact under any of the windfall tax proposals is that oil companies will receive billions of after tax dollars that they did not expect, should not need, and do not deserve. The fact that they will pay some tax on this windfall will not satisfy a public that will be paying as much as \$100 billion more for energy through 1985.

In addition, the Administration and the Congress have inflated their estimates of the tax take by assuming the oil companies will pay regular income taxes of close to 40 percent.

In fact, oil companies will pay little regular income taxes on the additional revenues from decontrol. Industry income taxes on domestic income average less than 20 percent.

Present taxes on nine major oil companies have been calculated by Public Citizens' Tax Reform Research Group to average 20.4 percent as follows:

*Effective U.S. tax rates on U.S. income for 9 oil producers—1977*

	Percent
Exxon.....	21.8
Standard Oil of Indiana.....	32.8
Mobil.....	10.8
Arco.....	1.7
Texaco.....	15.2
Gulf.....	20.5
Conoco.....	25.9
Getty.....	32.2
Marathon.....	15.9
Weighted average.....	20.4

Many large independents pay zero, one, or two percent in regular income taxes. Many also have unused tax write-offs that will enable them to shelter income taxes otherwise due on their added revenues.

Taken together, it is anticipated that regular income tax payments will continue to be low. In fact, The Congressional Budget Office has estimated the income tax rate on profits from oil decontrol will be around 15 percent.

**OIL COMPANY PROFITABILITY**

Those who argue that these additional revenues should inure to the benefit of the oil industry ignore the facts. Oil industry profits are at record levels under existing controls. With profits of 20 major companies up 53 percent in the first quarter of 1979.

*Oil company profit increases—1st quarter (1979)*

	Percent
Sunoco (Sun Oil).....	42.7
Mobil.....	81.3
Standard Oil of California.....	43.0
Conoco.....	343.0
Standard Oil of Ohio.....	303.0
Exxon.....	37.0
Gulf.....	61.0
Texaco.....	81.0
Shell.....	16.0
Amerada Hess.....	279.0
Marathon.....	108.0
Cities Service.....	42.0
Getty.....	42.0
Standard Oil of Indiana.....	28.0
Occidental.....	174.0
Atlantic Richfield.....	61.0

Return on equity for the oil industry has also jumped to record levels in 1979 before decontrol.

## Annualized return on equity based on 1st quarter of 1979

	Percent
Exxon.....	18.0
Standard Oil of Ohio.....	33.0
Standard Oil of California.....	17.0
Standard Oil of Indiana.....	19.5
Phillips.....	20.0
Marathon.....	29.0
Mobil.....	19.6
Continental.....	20.0
Amerada Hess.....	33.0
Sun Company.....	16.0
Cities Service.....	16.0
Getty.....	14.6
Gulf.....	13.0
Shell.....	14.7
Texaco.....	13.0
Average return on equity—all corporations (1978).....	15.0

The industry has promoted additional misinformation on return on equity.

While it is true that return on equity is a good measure of profitability of industry generally, return on equity can understate the profit picture of certain industries that are highly capital intensive and that internally generate most of the capital as opposed to borrowing funds. Also, return on equity is measured as profits as a percentage of equity and depends upon how profits are determined. Traditionally, oil industry profits, particularly of the major companies, have been understated by the use of various accounting techniques.

A more accurate measure of domestic oil profitability would be to look at major independents whose income is from domestic oil production alone. Those rates of return have averaged about 25 percent in 1976. They are up considerably in recent years.

In any case, return on equity is at an all time high averaging about 18 percent (before decontrol) up from around 10 percent in the 1960's and 1970's. To believe the oil industry, it must have been a struggling, almost extinct sector of the economy before the mid-1970's.

But to those that understand the workings of the oil industry well, this return on equity is not the complete story. Many profits are hidden in inventory profits or other accounting techniques.

Inventory profits alone would increase oil company earnings by over \$10 billion annually. "Successful efforts" accounting allows companies to capitalize drilling for successful wells while immediately writing off unsuccessful ventures. This, as well as the practice of amortizing leases on non-productive fields, understates profits by additional billions of dollars.

Industry cash flow is another factor in oil company profitability. Industry cash flow is at an all time high with Exxon's cash flow running more than \$4 billion annually. Mobil, Texaco, and Amoco all have more than \$1.5 billion cash flow.

All of this points to the fact that the industry is very profitable and floating in excess cash flow. Given this, decontrol can certainly not be supported on the ground that it will provide needed capital to the industry. The only result of decontrol would be to allow the industry to amass record amounts of cash which they have been using to buy up competing energy supplies, other oil companies, and many non-oil related companies.

## CONCLUSION

Stripped of all the industry subterfuge, the decontrol debate is not about providing needed revenues for the oil industry. They are awash in cash.

It is not about creating incentive prices for new oil discoveries. The present differential between old oil and newly discovered or hard-to-get oil is the best incentive for continued exploration.

It is not about raising prices precipitously to force more conservation. Poor families are already pushed to the limits of conserving and will now have to choose between energy and other basic necessities. And it cannot be about saving the costs of imported oil because the \$17 billion short-term price tag (through 1981) and the \$86 billion long-term price tag (through 1985) is foolishly wasteful for what we are buying.

Under decontrol, each saved barrel of imported oil will cost American consumers between \$65 and \$150.

If we're going to launch a new \$17 billion energy program, then let's raise taxes on energy by that much and put the money to use directly buying energy savings installations (mass transit, etc.) or more energy subsidizing solar installations (alternative supplies, etc.).

Letting the oil companies be the collection agents for that \$17 billion "high energy cost" tax and the purchasers of our energy savings is a bad bargain.

One thing is clear—there is no direct link between higher prices and greater energy production, but there is clearly a link between higher energy prices and the adverse effects on our economy in lower productivity and increased inflation and the adverse effects on American families' pocketbooks.

We urge you to continue controls through 1981 and beyond as the only answer to continue to provide adequate and certain incentives for new energy production while protecting the American public from cartel pricing and oil industry profiteering.

There is no real decontrol issue. The only issue is who will control oil prices—government officials accountable to the public or the OPEC oil cartel in concert with the major oil companies—accountable clearly to no one.

#### MAJOR OIL COMPANY MARGINS ON U.S. CRUDE OIL PRODUCTION

[Dollar amounts are per barrel]

Company	Average 1978 U.S. produc- tion cost	Average 1978 U.S. selling price	Difference	Difference as percent of cost
Exxon.....	\$1.39	\$8.06	\$6.67	480
Mobil.....	1.52	8.33	6.81	448
Texaco.....	1.93	8.82	6.89	357
Socal.....	2.38	8.53	6.15	258
Gulf.....	2.64	8.90	6.26	237
Standard Oil of Indiana.....	1.89	8.89	7.00	370
Arco.....	1.88	8.09	6.21	330
Shell.....	2.66	9.06	6.40	241
Conoco.....	1.44	8.90	7.46	518
Tenneco.....	1.42	10.24	8.82	621
Sun.....	1.86	8.04	6.18	332
Phillips.....	1.58	8.53	6.95	440
Union.....	1.39	7.77	6.38	459
Sohio.....	2.42	9.04	6.62	274
Amerada Hess.....	1.64	11.79	10.15	619
Pennzoil.....	1.20	10.03	8.83	736
Average.....	1.83	8.94	7.11	389

Source: 1978 form 10-K as filed by each company with the SEC.

Senator GRAVEL. The next witness is Mr. Jonathan Lash, Natural Resources Defense Council.

#### STATEMENT OF JONATHAN LASH, NATURAL RESOURCES DEFENSE COUNCIL, INC.

Mr. LASH. Good evening, Senator. I am very pleased to be here.

My head is swimming with the variety of figures that have been put before you this afternoon. We have heard estimates, I believe, of the available supply of crude oil from 10 years to 600 years. I am not quite sure how the committee is going to resolve those conflicts and other conflicts of facts.

I am impressed by the sharp questions that have been asked throughout the afternoon, of every witness.

Instead of running through my testimony, which you said you will read, I would like to make a couple of points and then answer any questions you may have.

I would note that the Natural Resources Defense Council supported decontrol before the President announced decontrol. For a variety of reasons we supported it, most importantly because prices are a signal, and we are getting the wrong signals today.

We supported decontrol, however, only in conjunction with the strong tax and rebate system, because we believe that injustice will result from higher prices unless there is a rebate system.

It struck me during the course of the afternoon that one of the issues lying below the surface of a lot of the discussion was the difference between some of the Senators and some of the witnesses over whether there is a free market in the United States in energy, and what the effect would be if the Government got out of the energy business.

It seems to me that the Nation made the decision probably half a century ago, when the New Deal came in, that for certain commodities in certain areas of the economy the free market system was not workable and that Government intervention was inevitable to avoid the unacceptable consequences of the kind of sudden adjustments that the free market system makes.

We had evidence then, and we still have evidence now, that the free market system can eat human beings. I think a lot of the debate before you today, and that will be before you in ever increasing intensity in the next coming months, may focus on that.

We are really talking about what kind of intervention is appropriate for the Government to make in the energy field today. Certainly, no one will deny that the Government has been heavily involved over the past decades.

A recent domestic study revealed that during this century there have been something on the order of \$100 billion in direct and indirect subsidies for the oil industry, in addition to subsidies for gas, coal, and nuclear. Certainly the price control system we have had, the import quotas we imposed at one time, a number of other policies ranging as far as the highway trust fund, have had an impact on the nature of this Nation's expectations as to energy consumption.

Now we have to change some of those expectations. Once again it is going to be necessary for the Government to intervene and to play some role. No matter what we do, the effect of Government policy will be to shape the country's energy future.

We are arguing over what that future should be. You have had such a tremendous variety of estimates this afternoon, and as one looks at what the Department of Energy says will be the effect of decontrol, on the one hand, the Congressional Budget Office's estimate, on the other hand, occasional eruptions from university sources that give a completely different set of figures, it seems to me it is going to be impossible to have a reliable set of data and say, "Everybody look at these data, and now let's make value judgments."

We are going to have to use some commonsense. Commonsense tells me if we raise the price of energy, we are going to use less. Commonsense tells me, and anyone else, if there is more energy available and we raise the profitability of producing that energy, we will probably produce more.

There are differing estimates as to how much is necessary to produce how much more. A lot of the discussion this afternoon sounded as if the proposed windfall profits tax, either that proposed by the



administration or that which came out of the Ways and Means Committee last week, was a confiscatory tax, a 100-percent tax, that there will be no profit if we have a windfall profits tax.

In fact, as I understand the Ways and Means Committee tax, although it has a nominal rate of 70 percent for tier 1, 2, and 3, with certain incentives for new oil and Alaskan oil, it will have an effective rate of under 40 percent; 60 percent of the new revenues to the oil companies will remain with them under the Ways and Means proposal; 60 percent is still a very great deal of money.

At a certain point we have to make a determination that we don't know exactly how much is going to get us how much. We have to admit that and begin looking at other social issues.

I think the transfer of that amount of wealth raises social issues, and it is appropriate for the Government to retain control of that flow of wealth.

I think the windfall profits tax proposal is essentially that: It is an assertion by the Government, the Congress, and the President that you will maintain control of this—

Senator GRAVEL. Let me ask you, because I think it is a very fundamental statement you are making: I agree it is a question. Have you in your own analysis made a judgment or compared the figures of what is potential under the excess profits tax of \$6 billion or \$7 billion, as opposed to what amounts to the transfer by the purchase of \$40 billion plus, or actually it will be around \$50-some-odd billion now with the increases, of shifting that money abroad, what Mr. Ruff was talking about earlier?

This has been the largest transfer of wealth since the conquistadores hit the continent. When you are saying let us have a tax because you are concerned about the \$7 billion, what about the \$40-plus billion—that is not all transfer, but I'll bet you the net of transfer is considerably more than your \$7 billion.

Mr. LASH. Mr. Chairman, I think that is obviously one of the central questions. If one could know for a certainty that, by having decontrol and no windfall profits tax, as Mr. Ruff believes, within 18 months we would have eliminated any oil shortages in the United States, we would be importing no oil and no natural gas, and prices would be falling, it would be very difficult to resist that proposal.

But there are a lot of other observers who feel that, with that amount of money, you would not obtain that result, you would not, in fact, eliminate the need for importing oil. You might reduce the need for importing oil by some small increment. I certainly would not have advocated decontrol if I didn't think you would reduce imports and reduce consumption.

Senator GRAVEL. Would it not follow, if you decontrol, the purpose of that is (1) to have Government involvement and (2) to get some money on the problem? So, if you withdraw some of that money, then you are making a value judgment as to how much of an effort you want to make getting more oil.

I don't think we can argue that; it is question of degrees.

If you, in your judgment, feel that we can do justice with \$7 billion less application, then fine.

Mr. LASH. I have to resort to making some rather mundane observations. It seems to me that there have been only two arguments ad-

vanced for decontrol: One is increased conservation or the use of other resources because it makes them look better, and the other is increased production.

How much of a tax you impose has no effect on conservation or the use of solar or alternative resources. So we can put those aside. They don't figure in the tax issue.

Senator GRAVEL. You are right, because by decontrol, obviously, you have some degree of elasticity, probably not a great deal. I will buy that.

Mr. LASH. I believe there is some elasticity, probably more than DOE admits. After all, industrial energy consumption since 1973 has remained astoundingly level. The conservation that industry has been achieving, even with price increases, in the past has been impressive. I believe there is some elasticity, but whether the increased proceeds go into Exxon's pocket or Uncle Sam's won't have an effect on that elasticity.

So I think we have to focus on the increased production.

As I have listened this afternoon, I have heard two separate lines of argument for leaving the money with the industry: One is increased incentives, and the other is making the capital available for the tremendous investments necessary for the production.

Now, here I begin to feel like I am walking in quicksand. I don't claim to be an expert. I have to stand back and look at it with some commonsense. The incentives will be there with the administration's proposal, which has an effective tax rate, I think, calculated to be under 30 percent. Incentives will be there with the Ways and Means proposal, with an effective tax rate of 40 percent. In fact, the Ways and Means wrote in, as I am sure you are aware, a very strong incentive program for newly discovered oil, taxing it at a lower rate.

So the incentives are there. We may argue whether that is enough of an incentive. It certainly is a very sharply increased incentive compared to what is available now, so we fall back on the issue of generating necessary capital.

Senator GRAVEL. That is at variance with what the people in the industry tell us. You are making a judgement that, because a politician on the Ways and Means Committee or somebody in the executive says this is an incentive, that is an incentive. Isn't that incentive to be judged by the people who are supposed to be receiving the incentive?

Mr. LASH. I think I would differ only in terminology with you. If under controls a year ago I testified that, on a new well, I would receive a certain return on it, that return will increase under decontrol; that return will increase even if 50 percent of that profit is taxed away.

Senator GRAVEL. If that judgment is in error, then I won't get the return I think I should get in the marketplace; therefore, I will have a tendency to get out of the marketplace under the proposals tying you to inflation?

Mr. LASH. I don't think we disagree.

Senator GRAVEL. I think we disagree on this: I think you have a lot more faith on how well the Federal Government functions, and I have no faith in it. I have seen too much of it.

Mr. LASH. Let me put it a little differently. Maybe I am not expressing myself clearly.

When you and I invest in a new enterprise—let us say it is not oil but a bicycle store; after all, bicycles are becoming more and more

necessary—and we make profit from that, the Federal Government takes away some of that profit. We pay a corporate income tax on it. When we make our calculations where we want to use our money to set up a bicycle store, we make a calculation as to its worth in light of the fact that Uncle Sam will take 46 percent of the profit. The windfall profits tax just changes that calculation for the oil industry; it still does not say it will take away—

Senator GRAVEL. That is right. It does change it substantially; it indexes their profits to inflation. This is a bureaucratic judgment that is made. If this is meant to prevail on the bicycle industry, then we have another calculation to make.

Now, you and I have to make a calculation, hopefully, that somebody will give us the proper rate of inflation and will give it to us currently, because if we lag behind, then our profits are going to diminish.

Mr. LASH. It does not index their profits to inflation; it says that the tax rate changes, depending on the level of the price of oil, and it says we will use constant dollars on the price of oil.

Senator GRAVEL. The constant changes all the time. Every time we get too high for the numbers, we change the constant. Maybe I am making myself appallingly unclear.

The Ways and Means Committee proposal says that, for newly discovered oil, if the price of oil is below \$17 a barrel in constant dollars, it is not taxed. It says for newly discovered oil, if the price of oil is between \$17 a barrel and \$26 a barrel in constant dollars, it is taxed at a 50-percent rate; that is, the company keeps 50 percent of the profits and the Government takes 50 percent.

For prices above \$26, it goes to 70 percent.

Now, in order to keep it in constant dollars, you have to deal with the inflation adjustment. The committee added an extra 2 percent, so that those \$17 and \$26 figures go up with inflation plus 2 percent. That doesn't tie the profits to the inflation, it simply ties what tax rate is applied. Even at the 70-percent tax rate, the company is getting a return; they are making a profit.

What if the rate of inflation is higher for drilling and production than it is for the Nation; would you get a compression there?

Mr. LASH. That is if the expenses of finding the oil went up faster here than the OPEC price? It is all tied to the OPEC price.

Senator GRAVEL. Fine. Do you think that might happen?

Mr. LASH. There is certainly a possibility that profits would be reduced because expenses here rose more quickly than the OPEC price.

Senator GRAVEL. Has it happened in other industries? That is what the economy is all about, these disparaging events that occur. That is why we have cycles; that is why we have difficulties.

Mr. LASH. I agree, that is what the economy is all about, but that kind of judgment is what the Government is about.

Senator GRAVEL. Why would you want to place that kind of regulation on energy when you are not prepared to do it on food, or are you prepared to do it on food? Food hurts just as much.

Mr. LASH. I am not prepared to do it for food.

Senator GRAVEL. Nor for bicycles nor for trailers?

Mr. LASH. Nor am I advocating, at least I don't think I am, advocating a price control system on oil.

Senator GRAVEL. They think it is. You know you are prepared to say that you are not the final word on this, but if the industry thinks it is exactly that to the point where a major company like Mobil says, "Keep your decontrol, keep this permanent tax control away from us," wouldn't that be some indication that maybe the way you proceed is the way it turns out?

Mr. LASH. Certainly; I have in my written testimony the reference to the fact I used to be a Federal prosecutor. In almost every case I have tried, there were at least a dozen witnesses who didn't agree with each other. One could never tell what the facts were. In the end you always had to say to the jury, "Look at the commonsense, look at the person who is testifying, and see what his interest is, and evaluate his testimony according to that."

Senator GRAVEL. In the marketplace, that is not the way it works. People either buy the stock or don't buy the stock; it either has a profitability or does not.

Mr. LASH. If I could finish my answer, Senator.

If I were an oilman I would make my judgment of the various proposals before the Senate, proposals that the administration is considering, based upon which I thought would leave me with the greatest profits; that would be my duty to my stockholders. I don't blame Mobil for doing that. Mobil has drawn its conclusion that it would make more money having no tax, no increased tax, no OPEC rents tax, and no tax for future OPEC increases, since oil is steadily being decontrolled because of the decline curve; it would make more money that way than with the tax.

That is an important question for Mobil, for the Senate, and for the Nation.

But there are countervailing questions for us, for the Senate, for the administration, and those questions can't be decided simply in terms of the profit and loss sheet of the oil companies, although that is a relevant consideration.

Senator GRAVEL. Thank you very much. I will have a chance to go over your statement. Thank you.

[The prepared statement of Mr. Lash follows:]

STATEMENT OF JONATHAN LASH, NATURAL RESOURCES DEFENSE COUNCIL, INC.

Mr. Chairman, I am Jonathan Lash. I am an attorney with the Clean Energy Project of the Natural Resources Defense Council. NRDC is a nonprofit membership organization dedicated to the protection and enhancement of the human environment and the conservation of our natural resources.

NRDC was one of several environmental organizations that took a position two months ago in support of oil price decontrol.

We supported decontrol because controlled prices lie to us about energy. They lie to us about the supplies and cost of energy available to us. They lie about the importance of insulating our homes. They lie about the value of solar energy. We are a nation tangled in a web of energy lies of our own making. We have created for ourselves a fantasy world, a kind of Big Rock Candy Mountain in which we need never consider scarcity. Judging by public opinion over the last few years, and especially the last few months, it appears that we consider it the responsibility of Government to maintain the fantasy—at any cost.

NRDC supported decontrol contingent upon passage of a strong windfall profits tax and progressive rebates of the proceeds to individuals. That was not, of course, what we got. Phased decontrol has begun. The Administration proposed a windfall profits tax with an effective tax rate of less than 35 percent. The House Ways and Means Committee has reported a bill with an effective rate estimated to be five or ten percent higher. We believe the effective rate should be markedly

higher. Specifically we believe that the 70-percent-tax rate approved by the Ways and Means Committee should be increased to 80 percent, that Alaskan oil should be treated similarly to other newly discovered oil, and that if, as proposed by the Ways and Means Committee, newly discovered oil is taxed at a lower rate as an incentive, that incentive should be phased out at \$26 per barrel in constant dollars.

Why create a special tax for oil industry profits? No one is proposing a windfall profits tax on moped or bicycle manufacturers, yet they too profit from rising oil prices. There are several reasons. First, it is Government policies that have put the industry in the position to make vast and sudden profits. The Federal Government has provided direct and indirect subsidies of over \$100 billion to the oil industry. The industry is profiting not because of the superior quality of its product, but because it controls the supply of an essential resource. Governmental intervention in such circumstances is traditional in the United States. Finally, it makes sense for the Government to assert control of so enormous a flow of capital.

Decontrol makes sense only as a component of an energy policy—to promote conservation and use of other resources, and to encourage domestic production. Of course, the pocket in which the money ends up has no bearing on conservation. The only purported policy justification for increasing oil company profits is to encourage production. That argument in turn has two parts: Greater profits are necessary as an incentive, and greater profits are necessary to finance new exploration and advanced recovery techniques.

Much of the discussion of these two arguments takes on the same fantasy-land quality as our view of energy supply generally. The industry spews our figures, DOE spews out figures, and occasionally a university or think-tank erupts. They all differ.

I used to be a prosecutor before I realized that public interest energy work would be more exciting than playing cops and robbers. It almost always seemed to be the case that all of the witnesses told a different version of events, but jurors usually had the answer—common sense. I think common sense is the answer here too.

The oil industry is not going broke. Even with controlled prices, industry profits last year were commensurate with other large enterprises, and production profits were around 20 percent, all above average. Profits this year have been far higher. Decontrol and OPEC price increases will multiply these profits stupendously. Even if more than half the profits are taxed away, less than half of the profits will still be much more than the industry already receives. Thus, there will be a huge incentive.

Great Britain taxes 70 percent of the profits from North Sea oil. There has been no dearth of industry interest there. Canada charges royalties which are not tax deductible, collects an income tax and imposes an export charge on her oil, which together far exceed the proposed taxes on new oil in the United States, yet exploration continues in Canada. A deductible 50 percent tax is a joke, A joke on the American people.

As to the availability of capital for new exploration, I am puzzled at that argument. First, of course, the industry apparently has the capital to buy department stores, coal mines, solar energy companies and electric motor manufacturers. Second, it is difficult to believe that one of the biggest industries in the world will be unable to find capital to develop one of the most necessary resources on earth. Other industries manage to find capital for riskier ventures.

It is in the national interest to raise oil prices. It is in the national interest to control the disposition of the revenues from increased prices. The tax is the mechanism for such control and it must be strong enough to achieve that purpose.

Finally, we oppose the creation of an Energy Trust Fund. The Administration has suggested that the Fund should be used to support energy production initiatives, urban mass transit, and assistance to low income energy consumers, but has not yet made public any specific proposal for the disposition of the Fund. We fear the Fund would become a means to evade effective Congressional control over subsidies to the oil industry for uneconomic technologies.

The proceeds of the tax should be used to ease the tax and energy cost burdens on individuals. (Such a disposition of the revenues of the tax would not interfere with the energy conservation effects of decontrol if the payments were not tied to energy consumption.) In the face of increasing evidence that a recessionary cycle is beginning, both equity and good sense suggest that Congress should provide for tax relief to individuals.

If Federal expenditures to promote energy conservation and production are justified, they should undergo the normal authorization and appropriations process. The creation of the Energy Trust Fund will inevitably undermine that

process, for the question will become "How shall we spend this money for energy projects?" instead of "How much of an expenditure on energy projects is appropriate?" We should not limit ourselves to choices between Tweedledum and Tweedledee.

There will be tremendous pressure to spend the funds on projects that industry has shied away from because they are uneconomical, impractical, or unready. If viable, useful projects cannot be found to absorb the proceeds of the Trust Fund, familiar white elephants—projects too clumsy to scramble through the ordinary course of congressional scrutiny—will be dragged forward to receive huge subsidies. Good projects have no need of special treatment. We are fully willing that projects we support be subjected to normal congressional analysis. No project should be exempt. What benefit can there be in committing tens of billions of dollars to as yet unidentified, unexplained, unanalyzed energy expenditures?

Thank you for the opportunity to appear.

Senator GRAVEL. Our next witness is Mr. Masselli, Friends of the Earth.

### **STATEMENT OF DAVID MASSELLI, FRIENDS OF THE EARTH**

Mr. MASSELLI. Thank you, Senator. I am David Masselli, energy policy director, Friends of the Earth. I will try to summarize my statement very quickly. It is a statement which is relatively devoid of figures.

I think the major point that I would like to make is that, over the next 10 years or so, regardless of what position the Congress takes on windfall profits taxes, we will be paying more and more for less and less oil.

Regardless of domestic production, almost any estimate I have heard prior to listening to Mr. Ruff, we will be sending many dollars abroad because under almost every scenario that has come from Government, from industry, or from academia, our imports of oil will either stay constant or increase, whether or not domestic oil is decontrolled.

We have taken a position in favor of decontrol. We think that there are a significant number of positive benefits that will arise from decontrol, which are discussed in my testimony.

The most important result of decontrol, I think, is that it will establish a rational pricing system.

I would like to make it clear that a rational pricing system and a market are not necessarily the same thing. I would be as pleased as almost everyone if there were a market for oil.

It strikes me that the existence of OPEC renders that an impossibility; however, a rational pricing system is in itself, I think, an important goal. As environmentalists, we have generally been aware of the role that improper pricing of energy sources has played over the years.

The true costs of energy have been hidden from the American public. The years of abundance and inexpensive energy that people often refer to, and then say it is gone, I don't think that that ever occurred. To be sure, the energy costs were much, much cheaper in the 1950's and 1960's, but much of that cheap energy was dearly bought and paid for in Federal subsidies, tax loopholes, exposure of workers to unreasonable safety risks, countless instances of degradation of the environment, the damming of free flowing rivers and streams, ruining of Appalachia, and enormous quantities of air and water pollution in cities and the great outdoors.

The most important price paid for cheap energy was the abandoning, for a quarter of a century, efforts to improve efficiency to create a less energy wasteful system of transportation, businesses, and homes, and to develop safe and alternative supplies of energy.

We created instead a Nation of energy junkies who responded correctly to what were illusory price signals, telling them that more and more energy would continue to be available at low prices.

To the extent that decontrol brings an end to that, I think it is an appropriate and long overdue move. I would add, parenthetically, last year we supported similar efforts with respect to natural gas. I don't believe that anyone is terribly pleased with the Rube Goldberg-type mechanism which now regulates natural gas prices, but in our view, at least it is an improvement over the previous regulatory system and, hopefully, in the out years after 1985 it will lead to a system in which natural gas is appropriately priced and properly used.

One of the key issues that we faced in looking at decontrol was the effect of decontrol on the poor, and that is something we were quite concerned about.

We are told that all energy must remain underpriced so that the poor will be able to afford it. That strikes us as a policy which allows the rich access to large amounts of cheap fuel ostensibly for the purpose of letting the poor have access to small amounts which, while below market value, are still too expensive for them to afford.

We don't believe this can be justified as a special welfare measure.

We also believe, regardless of decontrol, energy prices for the poor will rise; they will rise quickly, and it will be necessary for special Government measures to help cushion the poor, and particularly the poorest of the poor, from the cost of energy price rises; and this will be necessary whether or not there is decontrol.

Given these views on decontrol, we more or less found ourselves looking at the question of the windfall profits tax. I think when we looked at the reasons which we felt justify control, and the reasons why the establishment of this rational pricing system was necessary, we found that almost none of the goals of decontrol are furthered by producer retention of the additional profits.

Decontrol addresses a macroeconomic problem caused by the existence of a resource cartel. Once you have a single world price at the consumer end, then most of the goals of decontrol are achieved. The entitlement program is gone. Efforts in alternative energy systems are stimulated. These happen whether or not there are excess revenues to domestic oil producers.

The only thing which, in our mind, could justify low windfall profits tax or the lack of windfall profits tax totally would be the idea that the supply response would be such that, without a windfall profits tax, there would be major supplies.

We just don't see that coming about. The one set of figures that I do have in my testimony comes from the National Energy Plan II, which notes that in the period to 1981—and I think this is really the appropriate timespan to use when we are talking about decontrol because this is when old oil is being decontrolled and I don't believe that anyone has ever thought that after 1981 that particular system of controls would exist—that in that period of time the oil companies will have received \$9.5 billion, and under DOE's assumptions, which

some of us feel to be optimistic, they would generate a little over 440,000 barrels a day additional supply. This, incidentally, would not keep pace with additional demand.

So our imports would continue to go up. That 440,000 barrels a day is about 2 percent of our daily consumption, and if one assumes that the \$9.5 billion is what we were paying for it, then that indicates that we will be paying about \$60 a barrel for that additional supply.

Now, there are figures floating about, and you have heard something today, everything from \$40 a barrel to \$500 a barrel, for the cost of the so-called incremental supply. Whatever they are—and I am not claiming these are the perfect figures—in terms of added supply response, we are not going to be getting a great deal for the added revenues which are going to the oil producers, I think, quite frankly, because there is not that much more oil to be produced, and that much of it would be produced in the normal course.

For these reasons, we find ourselves compelled to support a rather stiff windfall profits tax.

To go back to the point which I think you last were making, I could think it is important to recognize that the way the windfall profits tax works, it is not taking away revenues which are now guaranteed by control; it is, in essence, reducing revenues which come to producers because of the actions of OPEC in increasing the price of oil.

We believe that, as long as the cartel is able to effectively set the world energy price, it is foolish for us to price our own domestic oil below that; and, second, it is equally foolish to allow that increment to go to the oil companies, or at least to allow the vast bulk of it.

For that reason, we have supported an 85 percent tax, and we have looked somewhat favorably upon the 70 percent tax as it was originally proposed in the House Ways and Means Committee.

Thank you very much.

Senator GRAVEL. Thank you. I will be reading your statement totally.

Our next, and last, witness, I believe is Mr. Robert McIntyre.

**STATEMENT OF ROBERT S. McINTYRE, DIRECTOR, PUBLIC  
CITIZEN'S TAX REFORM RESEARCH GROUP**

Mr. McINTYRE. Senator, given the fact that you and I are the only ones here, if you will promise to read my written statement, I will promise to limit my oral remarks to a 2-minute summary.

Senator GRAVEL. I will read your statement carefully, and, in fact, I plan to read all the statements and compare the figures in them.

Mr. McINTYRE. We have included in our statement an analysis of the Ways and Means Committee bill, which I think is good. It is an improvement from the administration bill, from our standpoint.

We also have an analysis of the kind of income taxes oil companies are paying now, which I think is relevant in trying to determine what they ought to pay on windfall profits.

Now, in the 2 minutes I have allotted myself, I would like to briefly summarize the issues involved here. First of all, I think all of us agree that there is a conservation problem in this country that decontrol speaks to.



Now, the second issue involves whether we can get a serious supply side response from decontrol. In designing the windfall profits tax, I think it is fair to say that we should not seriously interfere with any of the goals of decontrol.

As Mr. Lash noted, no matter how tough the tax is, it will not interfere with our conservation or alternative energy goals. We can make it 110 percent and these goals would be achieved, in terms of making alternatives to oil more attractive.

In terms of the production side, we have to make a decision about what we are trying to make happen, and let the tax interfere with it as little as possible.

In the case of already discovered oil—oil being produced today—which is generally most of the oil that is being decontrolled now, the tax level has very little to do with what will be produced, because it is already being produced at a profit. In terms of incentives, we really are talking about new oil discoveries or tertiary recovery. We are talking about oil resulting from doing something extra over what we are doing now.

In the case of newly discovered oil, the Ways and Means bill provides an exception from the windfall tax up to a price of \$17 a barrel; in case of tertiary recovery, an exception up to \$16 per barrel.

So we have a bill which has come out of the Ways and Means Committee which is directed toward providing a very large incentive for getting into those areas.

Now, the other issue is, do the oil companies need that extra cash just in general? If they do, maybe we should let them keep more money. But the majors are the ones that generally own the old oil, and the major oil companies are not short of cash.

Exxon testified before the Ways and Means Committee today. They were asked whether they had any cash problems at all, and they stated emphatically, "No, we have no capital problems. We are looking for places to spend money. We actually have no cash flow problems."

They suggested that they were typical of most of the large oil companies.

For the independents, who do most of the exploratory drilling, the issue is the price of newly discovered oil; not plowback on old oil, not low windfall tax rates on old oil.

It seems to me we can agree on 90 percent of the issue here, and then talk about balancing the interests of consumer protection and providing funds for alternative energy research against production incentives on newly discovered oil.

I think the Ways and Means bill is a reasonable one. I think they should have done a little better on newly discovered. It is a reasonable balance. I think, really, the issue is rather narrow.

That is about what I wanted to say to you today.

Senator GRAVEL. Thank you very much.

[The prepared statement of Mr. McIntyre follows:]

**STATEMENT OF ROBERT S. MCINTYRE, DIRECTOR, PUBLIC CITIZEN'S TAX REFORM RESEARCH GROUP, ON DECONTROL OF DOMESTIC OIL PRICES AND TAXING WINDFALL PROFITS**

On April 5 of this year the President announced that, pursuant to authority granted him by Congress in the Energy Policy and Conservation Act of 1975 he would begin the phased decontrol of domestic oil prices—or, perhaps more aptly put, the phased shift in control authority from the Federal Government

to the OPEC cartel. Clearly a fallback position for the administration from its 1977 proposal for a crude oil equalization tax, this profound change in the price-setting mechanism for domestic crude oil will add tens of billions of dollars to oil producers' revenues, dollars which will be paid in higher energy costs by American consumers.

In his energy address, the President made a number of commitments to the American people. He pledged to take important steps to enhance America's conservation efforts and to speed up the development of alternative energy sources. He promised to "demand that [the oil companies] use their new income to develop energy for America, and not to buy department stores and hotels." He said he would ask Congress to close foreign tax credit loopholes, a step which has already begun in the House budget process and is now before the Ways and Means Committee. Finally, and most important, he promised to avoid putting "an undue burden on people who can hardly make ends meet as it is" by fighting for a windfall profits tax to recapture some of the new producer profits for the public.

How this last presidential promise will be implemented is the issue now before the Congress. It arises at a time when oil producer profits are at record highs, with many companies showing annual returns on equity for the first quarter of this year at levels a third or more above last year's average for all U.S. industry. Cash flow is now so great for some companies that they are laughing at the President's admonition about acquisitions. Just two days after the President had repeated his remarks about mergers at a press conference, Standard Oil of Indiana announced its intended purchase of Cyprus Mines, Inc. for \$450 million. Mobil continued its efforts to acquire the Bodcaw timber company for over half a billion dollars, although it has since been beaten out by Weyerhaeuser. Exxon has bid close to a billion dollars for Reliance Electric.

The responsibility is now on the Congress to assure that the people of America are not unfairly victimized by decontrol. The Ways and Means Committee has sent to the House floor this week its windfall tax bill. Although we are troubled by several items in the House bill, we believe its general approach is commendable. Certainly, it is a substantial improvement over the administration's windfall tax plan, which was not an adequate corollary to decontrol.

In a few weeks the House bill will come before the Finance Committee. The remainder of our testimony is devoted to our recommendations on how a fair windfall tax should be designed and how the Ways and Means bill can be improved.

#### WHY HAVE A WINDFALL TAX?

Although decontrol will mean a massive transfer of funds from consumers to producers, there are those who are rather sanguine at the prospect of the companies keeping almost *all* of the new revenues. They maintain that the oil companies would have been garnering these profits already had Congress not intervened with controls. Such a contention, however, misses the point. The prices currently obtainable for oil absent controls have little or nothing to do with fair market prices, producer costs, or "just deserts." Instead, they are set by a foreign cartel which controls them by a combination of direct price-fixing and supply manipulation. Domestic controls act to take away from American producers some, although not all, of the windfall benefits which the foreign price-fixing would otherwise provide them. But such restrictions on price gouging are no more intrinsically burdensome than are the antitrust laws, public regulation of utilities, or any other curbs on the abuse of concentrated power.

Given the extreme burdens of decontrol on consumers, a windfall profits tax to recapture some of the revenues for the public is not only appropriate but essential. This is especially true in light of the regular corporate income tax's historic failure to exact a significant share of oil company profits for the commonweal. *Except where the tax would seriously interfere with the purposes of decontrol, we believe that the tax rate should be very high.*

#### MAKING THE WINDFALL PROFITS TAX CONSISTENT WITH THE GOALS OF DECONTROL

Decontrolling the price of domestic crude oil is designed to accomplish a number of laudable purposes, including:

- (1) To encourage conservation;
- (2) To encourage use and development of alternative energy sources;
- (3) To eliminate subsidies for importing foreign oil (i.e., the entitlements program);
- (4) To provide incentives for new oil discovery;

(5) To provide incentives for increased production from existing oil properties which currently cannot be achieved profitably.

Obviously, the first three listed goals are dependent only on the *price* of crude oil, and not on the share of that price going to producers. Therefore, if these were our only goals, something close to a 100% windfall tax rate would be appropriate. The achievement of goals (4) and (5), however, would seem to require a lower tax rate in specific circumstances. Specifically, decontrol coupled with any tax rate less than 100% on increases in prices allowed for newly discovered oil, oil obtained by using enhanced recovery methods, and so on, will augment the profitability of looking for or producing such oil.

This analysis leads to the conclusion that, in the case of oil categories in which additional production may be obtained, the appropriate tax rate requires a careful balancing of the incentives needed against the interests of consumer protection. In the case of oil categories in which the possibility of additional production is remote, the appropriate windfall tax rate on decontrol profits ought to approximate 100%.

#### REGULAR CORPORATE INCOME TAXES PAID BY OIL PRODUCERS

One of the important factors which Congress should keep in mind in formulating a windfall profits tax is the historic failure of the regular corporate income tax to exact a substantial share of oil producer income. Because of the various special preferences in the tax laws for oil income, as well as the large tax benefits available to capital intensive businesses generally, the oil companies have traditionally paid low effective tax rates on their earnings. And recent analyses indicate that the regular corporate effective rate is likely to remain low on decontrol profits.

The following evidence is presented to the subcommittee to illustrate how mistaken it would be to expect the regular corporate income tax to garner a significant portion of the windfall profits from decontrol of domestic oil prices:

A 1978 Treasury study of 1972 corporate tax burdens indicates an effective federal tax rate of 17 percent on oil producers' domestic income, when adjusted for intangible drilling cost writeoffs. ("Effective Income Tax Rates Paid By United States Corporations in 1972," Department of the Treasury, May 1978, p. 20.)

Information contained in 10-K reports filed with the SEC shows the effective U.S. rate on the domestic income of the major oil companies in 1977 and 1978 to be approximately 20 percent:

#### EFFECTIVE FEDERAL INCOME TAX RATES ON DOMESTIC INCOME FOR SOME OF THE LARGEST OIL PRODUCERS

Company	1977	1978
Exxon.....	21.8	(1)
Standard Oil of Indiana (Amoco).....	32.8	(1)
Mobil.....	10.8	25.1
Arco.....	1.7	(1)
Texaco.....	15.2	14.1
Gulf.....	20.5	5.1
Conoco.....	25.9	20.0
Getty.....	32.2	27.4
Marathon.....	15.9	14.8
Weighted average.....	20.4	18.8

<sup>1</sup> Year ending 1977 latest statistics available.

Source: All rates computed by the Tax Reform Research Group based on 1978 SEC 10-K reports, except Exxon and Amoco, which are based on the average of figures in Congressman Vanik's corporate tax study for 1977 and the June 12, 1978 "Tax Notes," and Arco, which is from the Vanik study.

Effective rates for independent producers are generally lower than for the majors. In fact some of these companies pay rates as low as one or two percent. Many independents would continue their low tax rates even without increasing drilling. Based on SEC data, nine of 16 randomly chosen independent oil and gas producers have net operating loss carryforwards from 1978. Seven of these nine also have investment credit and/or depletion carryforwards. An additional three companies have investment credit and/or depletion carryforwards (but no NOL carryforward). All 12 of these companies showed profits for shareholder reporting purposes, but 11 paid no federal income taxes other than the minimum tax.

## LOSS AND CREDIT CARRYFORWARDS FOR 12 INDEPENDENT OIL PRODUCERS

Company	1978 net income	Net operating loss carryforward	Investment credit carryforward	Depletion carryforward <sup>1</sup>
Baruch Foster.....	\$490,593	\$1,296,000	\$109,000	\$1,170,000
C & K.....	1,248,000	14,900,000	1,600,000	3,600,000
Consolidated Oil & Gas.....	5,818,000	3,100,000	1,000,000	4,300,000
Damson Oil.....	962,846	-----	724,000	1,215,000
Houston Oil.....	100,284,000	26,364,000	14,901,000	-----
Mitchell Energy.....	56,748,000	-----	3,000,000	-----
Forest Oil.....	15,773,688	41,954,000	-----	-----
Mesa Petroleum.....	68,036,000	91,000,000	-----	-----
Patrick Petroleum.....	3,053,849	3,546,000	346,000	998,000
Louisiana Land & Exploration Co.....	181,052,000	15,700,000	1,700,000	-----
Buttes <sup>2</sup> .....	6,726,000	11,100,000	6,920,000	-----
Inexco Oil.....	17,966,000	-----	4,700,000	-----

<sup>1</sup> Not all companies disclose this figure.

<sup>2</sup> Year ending 1977 latest statistics available.

Based upon this data, an estimate that overall effective federal tax rates on the U.S. income of oil producers are about 20 percent seems conservatively high. But, it might be said, isn't the marginal rate on a sudden upsurge in income likely to be higher? Although conclusion seems intuitively plausible, it is not borne out by the best historical evidence available—what happened after the 1973 oil embargo—nor does it agree with more careful analyses of the issue:

In 1973, oil company domestic profits increased by over 50 percent from the previous year and in 1974 they doubled from 1973. Yet the industry's effective tax rate increased by less than 2 percentage points in 1973, and actually dropped half a point in the boom year of 1974.<sup>1</sup>

An analysis performed by the Tax Reform Research Group using a methodology derived by the Library of Congress during consideration of a windfall profits tax proposal in 1975 suggests that the income tax rate on increased revenues from decontrol would be between 9 and 27 percent, depending upon reinvestment rates.

Finally, a May 1979 Congressional Budget Office paper on "The Decontrol of Domestic Oil Prices" concludes that the effective oil company corporate tax rate on increased profits from decontrol would average only 15 percent over the period 1979-85.

## THE OIL INDUSTRY'S LACK OF CASH NEEDS

There will be some who will argue before Congress that there is a need to have a low tax on increased oil producer profits on already-discovered oil or that some of the revenues from the windfall tax should be "plowed back" to companies which reinvest in oil exploration. We believe that such proposals are ill-advised, and urge that they be rejected. The only effect of such "plowbacks" will be to transfer more money from consumers to producers, reducing the funds available to aid low-income families and to finance alternative energy investments and mass transit.

The prices which will be available under decontrol for newly-discovered oil and enhanced recovery will provide ample incentives for investment in these areas—even with a tough windfall tax on already-discovered oil and future OPEC price increases. Plowback would, of course, increase the petroleum industry's cash, but there is no shortage of funds in the industry.

Mobil's purchase of MARCOR is now familiar to everyone, but it is only the tip of the iceberg. Just within the last year, Exxon has announced its intention to acquire Reliance Electric for \$1 billion; Mobil has attempted to buy Bodcaw timber company for over \$500 million; Standard Oil of Indiana announced its purchase of Cyprus Mines, Inc. for \$450 million; Occidental tried to pay \$900 million for Mead Corp.; Sun bought Becton, Dickinson & Co. (medical supplies) for \$300 million; and so on. The point is that the industry is not short of cash; to the contrary, it is awash in it.

In fact, the oil industry does not even borrow money like other businesses:

Exxon had no long-term debt at all until non-financial factors forced it to leverage part of its share of the Alaska pipeline.

<sup>1</sup> Testimony of Emil M. Sunley, Deputy Assistant Secretary of the Treasury for Tax Policy, before the Subcommittee on Energy and Foundations of the Senate Finance Committee, May 7, 1970, page 11. Using the National Income and Products Accounts (NIPA) as his basis, Mr. Sunley computed the oil industry's tax rates on domestic income as 20.4 percent in 1972, 22.2 percent in 1973, and 21.7 percent in 1974. Our experience with NIPA indicates that it has serious flaws as an accurate measure of company income (and tends to lead to overstated tax rates), but Mr. Sunley's analysis is useful for relative comparisons.

Standard Oil of California, pointing to a big increase in capital and exploratory expenditures in 1978, proudly told its shareholders: "These investment programs were financed entirely from internally generated funds. New borrowings . . . were more than offset by debt retirements. Long-term debt and capital lease obligations . . . represented 19 percent of total capital at the end of 1978, down from 22 percent a year earlier."

Texaco made capital and exploratory expenditures of \$1.6 billion in 1978, while reducing its long-term debt by \$100 million.

Mobil spent \$2 billion in capital and exploration activities in 1978 without any change in its long-term debt, and a decrease in its debt-to-equity ratio.

Gulf, which did increase its long-term borrowing by \$182 million in 1978, notes in its annual report that "although long-term debt increased during 1978, the Company's debt-to-capitalization ratio was only 16 percent at December 31, 1978."

Getty increased its capital expenditures by 26 percent in 1978, while reducing its long-term debt.

A June 1, 1977 *Forbes* article details the extraordinary amounts internally available to the oil companies for oil investments:

"And the oil companies have the cash flow ready and waiting to plunge into a new round of exploration. Exxon alone is running a cash flow of more than \$4 billion a year; Mobil, Texaco and Standard of Indiana are each at \$1.5 billion. The North Sea and North Slope are producing, beginning to return the investments made in them by the oil companies since the mid- to late-Sixties. The costly Alaska pipeline will begin throwing off cash rather than swallowing it. The industry's capital and exploration budget for this year runs to \$30 billion."

Outside funds have also been pouring into oil investments. The April 30, 1979 issue of *Business Week* reports that last year publicly registered oil and gas drilling fund deals jumped by 64 percent, to \$1 billion. Decontrol will make these investments even more attractive.

In explaining why the Ford administration rejected a plowback proposal in its windfall tax bill in 1975, then-Treasury Secretary William Simon summarized the issues well:

"The proposal does not include a credit for so-called 'plowback' investments. . . . Plowback is not justified because the amounts oil producers will retain after the tax as it is structured will provide a price incentive sufficient to attain our energy independence goals. To put it another way, there is no convincing evidence that permitting a plowback credit will produce significantly more energy than not doing so. Further, a plowback credit means that persons already engaged in oil production can make investments with tax dollars supplied by the government, while new investors must use their own money. We do not believe that kind of discrimination and anti-competitive effect can be justified.

"Plowback credits . . . would undoubtedly make existing oil producers wealthier than they would otherwise be, but would not significantly increase oil production. It is taxpayers generally who pay the prices that produce the windfall, and the revenues should go for the benefit of taxpayers generally."

Secretary Simon's point that plowback—or for that matter anything which reduces taxes on already-discovered oil—will inure only to the already oil wealthy is not merely an academic point. Writing in the *Wall Street Journal* recently, on behalf of the Independent Petroleum Association of America, Jude Wanniski notes that "in almost every case, a plowback provision is useless to an independent."

For the majors, who hold most of the old oil, plowback would be a bonanza. But, as was noted in a recent issue of the investment guide *ValueLine* concerning Mobil, their idea of increasing domestic energy supplies is "to buy domestic producing properties [rather] than to explore for them." (Mobil, for example, has just agreed to purchase a huge amount of already proven reserves for \$800 million.) The independents, on the other hand, who do 90 percent of the exploratory drilling in the U.S., are interested not in increased cash flow from old fields or plowback from taxes on already discovered oil, but in higher prices for new discoveries. This is why the lobbyists for the independents were so happy with the Energy Department's extraordinarily broad definition of "newly-discovered oil," and why they were ecstatic when the Ways and Means Committee *expanded* the definition, and set a high base price and a special lower windfall rate for newly-discovered oil. (See next section.)

Plowback would be nothing more than an additional windfall for the major oil companies, which would have almost no effect toward increasing domestic petroleum supplies.

## OIL COMPANY PROFITS—1ST QUARTER 1979

Company	Percent profit increase from 1st quarter 1978 <sup>1</sup>	Annualized return on equity <sup>2</sup> (percent)
Exxon.....	+37	18.8
Mobil.....	+81	19.6
Standard Oil of Indiana.....	+28	19.5
Gulf.....	+61	12.8
Texaco.....	+81	13.0
Standard Oil of California.....	+43	16.9
Conoco.....	+343	20.4
Shell.....	+16	14.7
Phillips.....	+4	19.5
Arco.....	+61	17.6
Occidental.....	+174	16.0
Getty.....	+42	14.6
Marathon.....	+61	28.9
Sun.....	+43	16.3
Amerada Hess.....	+258	33.2
Cities Service.....	+42	15.9
Ashland.....	+75	33.0
Standard Oil of Ohio.....	+309	32.8
Industry composites.....	+54	18.5

<sup>1</sup> From Business Week, May 21, 1979.

<sup>2</sup> Based on total equity at end of 1978.

## CRITIQUING THE WAYS AND MEANS BILL

The Ways and Means windfall tax is generally consistent in concept with the criteria for a good windfall tax we have discussed above. The tax is concentrated on already discovered oil. Increased production from tertiary recovery methods, generously defined, is exempt from the tax except at price levels above \$16 (plus inflation). Newly-discovered oil is taxed only if the world price exceeds \$17 (plus inflation), and then at a reduced rate.

There are several changes, however, that we recommend be made to the Ways and Means bill:

*A. Already-discovered oil*

(1) The rate: The 70 percent windfall tax rate generally applicable so already-discovered oil (after deduction for increased state severance taxes) is a substantial improvement over the administration's 50 percent rate (with no severance tax adjustment). But we believe that a higher rate would be more appropriate. Since this oil is by definition already being profitably produced at controlled prices, there are little or no production incentives from higher oil company profits. We suggest that a 90 percent tax rate would be a reasonable level.

(2) The phase-out of the tier one tax: The Ways and Means bill would phase out the windfall tax on the increase in price of lower tier or "old" oil from \$6 per barrel to the upper tier price of \$13 per barrel by July 1984, through the use of a 1½ percent linear decline curve (production above which is excluded from the one tax). The effect is to exempt about half of the cumulative production of what would otherwise have been lower tier oil from the tier one tax as of the July 1984 date. In addition, because of the phase-out, only 30 percent of the cumulative production through January 1989 of what would have been lower tier oil would be subject to the tier one tax. We believe that it would be more appropriate to subject all of the windfall profits from decontrol of lower tier oil to the tier one tax, a result which could be achieved through the use of an historical decline curve for tax purposes. If Congress decides to phase out the tier one tax, we believe a decline rate lower than that in the Ways and Means bill should be used. A 1½ percent linear decline rate would phase out the tax by May 1985, and would subject a substantially higher portion of the cumulative lower tier production to the tier one tax. The Treasury indicated to the Ways and Means Committee that it had no objection to the use of a 1½ percent decline rate.

CUMULATIVE PERCENTAGES OF LOWER TIER PRODUCTION<sup>1</sup> SUBJECT TO TIER-ONE TAX AS OF PARTICULAR DATES,  
USING VARIOUS DECLINE CURVES

Using—	As of—		
	Sept. 1981	July 1984 <sup>2</sup>	Jan. 1989
Historical decline after January 1980.....	98	99	99
1½ percent after January 1980.....	80	68	42
1½ percent (Ways and Means bill).....	68	51	30

<sup>1</sup> Lower tier production is production which would have been lower tier under price controls as of March 1979, assuming such controls were continued indefinitely.

<sup>2</sup> Phaseout date using 1½ percent-decline rate. For the 1¼ percent-decline rate, the phaseout ends in May 1985.

### B. Newly-discovered oil

We have no quarrel with the Ways and Means Committee's decision to tax newly-discovered oil only on prices in excess of \$17 per barrel (plus inflation), nor do we object to the use of a reduced rate on prices less than \$26 (plus inflation). In fact, we advocated such favorable treatment in our testimony before Ways and Means. We believe, however, that the Committee erred in over-broadly defining new discoveries for tax purposes and we also object to the 2 percent "kicker" in the base price for taxing newly-discovered oil.

(1) The definition of "newly-discovered oil": On January 2, 1979, the Department of Energy issued proposed regulations to decontrol the price of newly-discovered oil. The definition of "newly-discovered" paralleled that in the Natural Gas Act, to wit:

"crude oil produced from (1) a 'new well' which is at least 2.5 miles from an existing producing well, or the completion depth of which is at least 1000 feet below the deepest completion location of an existing producing well within 2 miles of the new well; or (2) a 'new lease' on the outer continental shelf (OCS)."

In addition, "newly-discovered oil" would have included oil from a "new reservoir," provided that commentators were able to justify such an inclusion in the context of DOE's purpose that "the incentive price should be available only for exploratory drilling activity."

The proposed regulations went on to note that the higher price was intended only for "drilling activities that are directed toward new field exploration rather than development, and which are, therefore, likely to involve a high degree of risk, as well as the possibility of significant new finds."

All in all, this was an admirable statement of the production-side purposes of decontrol. When the proposed regulations were finalized on May 1, 1979, however, it appears that DOE may have lost sight of those purposes. Instead of the 2½ mile or 1,000 feet rule, DOE adopted a "new property," test under which any crude oil produced from a property from which there was no production in calendar year 1978 will qualify as "newly-discovered oil." The reason for this change was baldly stated:

"Our decision to delete the depth and distance requirements and to rely exclusively on the property concept is based upon our determination that these criteria would cause substantial difficulties to [the] industry."

More specifically, industry commentators had informed the Department that "fewer than ten percent of onshore exploratory [sic] well drillings could be expected to qualify as new wells under the 2.5 miles and 1,000 feet criteria."

In the context of the President's decontrol announcement, DOE's decision to accelerate by two years the decontrol of oil from "new properties" may be a reasonable regulatory simplification. But such a consideration is not applicable to the decision about the windfall tax level on such oil. The exemption for newly-discovered oil in the tax—like DOE's original decontrol proposal—is intended to provide incentives "for drilling activities that are directed toward new field exploration," which "involve a high degree of risk" and the possibility of "significant new finds."

In the Ways and Means Committee, tax treatment as newly-discovered oil was limited to production from properties which did not produce before 1970, so that capped wells or oil that would otherwise be lower tier would not qualify. And an anti-gerrymandering rule was adopted, to try to avoid "new" properties being created from old ones. But the committee then added to the "new property" criterion a "new reservoir" one as well. We are told that this will substantially broaden the definition and create significant enforcement problems, as DOE feared in its original proposed regulation.

We recommend that the Ways and Means definition of "newly-discovered oil" be narrowed to include only oil from wells  $2\frac{1}{2}$  miles from or 1,000 feet deeper than another producing well.

(2) The 2 percent "kicker": Newly-discovered oil is subject to a 50 percent windfall tax on price increases in excess of \$17 per barrel, plus inflation, plus an additional 2 percent per year. Above \$26 per barrel, plus inflation, plus an additional 2 percent per year, the tax rate is 70 percent.

We recommend that the 2 percent "kicker" be eliminated. In deciding the proper tax treatment for newly-discovered oil, Congress must weigh production incentives against the need for revenues to protect low-income consumers and to finance alternative energy investments. In balancing these interests, we believe that \$17 per barrel plus a half share in any OPEC-caused further price increase is a sufficient incentive for new production, and that the 2 percent kicker is a mistake.

[From the St. Louis Post-Dispatch, May 6, 1979]

## ARE OIL COMPANY PROFITS TOO HIGH?

(By James Deakin)

WASHINGTON.—The word is getting around the oil companies are making a lot of money. Some people say they are making too much. Others say they are not. The others include the oil companies.

In the first 3 months of this year, after-tax profits of the petroleum industry were 56.9 percent greater than its profits in the same 3 months last year. This was comfortably ahead of the inflation rate for the first quarter of this year, which was 13 percent. Double-digit profits are nicer than double-digit inflation.

Exxon Corp., the nation's largest oil company, made \$955 million in profits in the first three months of 1979. This was an increase of 37.4 percent over the first quarter of 1978. If Exxon can keep up this pace for nine more months, its 1979 profits, after taxes, will be \$3.8 billion. Tough it out, Exxon.

Mobil Oil Corp., the second largest oil company, reported first-quarter profits of \$437 million. This was an increase of 81.3 percent over the first three months of last year. Third-ranking Texaco Inc. made \$307 million, an increase of 80.9 percent.

Standard Oil Co. of Ohio (Sohio) did very well. Its first quarter profits were up 302.6 percent over the same period last year. Continental Oil Co. had a batting average the Cardinals could use. Its profits increased 343.3 percent over the first quarter of 1978.

Gulf Oil Co.'s profits were up 60.6 percent, Standard Oil Co. of California, 42.8 percent; Sun Oil Co., 43 percent; Standard Oil of Indiana, 27.6 percent. However, inflation almost caught up with Shell Oil Co., whose profit increase was 16 percent. And Phillips Petroleum Co.'s profits were up only 3.6 percent. How now, Phillips?

The oil industry's first-quarter profits have caused a good deal of talk, most of it critical. President Jimmy Carter has proposed a windfall profits tax to prevent the oil companies from making what he says would be "huge and undeserved" additional profits from the decontrol of domestic oil prices.

President Carter, meet Secretary of Energy James R. Schlesinger. In an interview last month, Schlesinger said the oil industry's profits "certainly are reasonable. The profits have not increased in this industry since 1974. And in real terms, they have declined. The oil companies are not doing spectacularly well in comparison to other manufacturing industry."

This week, the Department of Energy accused seven major oil companies of overcharging customers almost \$1.7 billion. Together with earlier proceedings, this brought the total in alleged overcharges by oil companies to \$3.5 billion. Energy Department, meet Secretary Schlesinger.

The oil industry argues that its first-quarter profits were not excessive. It says they looked big because they were a bounce-back from abnormally low earnings last year. It says also that its profits resulted for the most part from foreign operations, with many oil companies showing losses on their domestic production. It says further that its profits were not out of line when compared with profits in other industries.

Over the 10 years from 1969 through 1978, oil companies averaged a 13.9 percent rate of return on investment, compared with 13.7 percent for all manufacturing industries, the American Petroleum Institute says.

In 1977, the oil industry's rate of return was 14 percent, compared with 14.0 percent for all manufacturing, and preliminary figures for 1978 indicate a 14.3 percent return for oil companies compared with 15.9 percent for manufacturing industries as a whole the API says.



Some industries had larger profit increases than the oil industry. Steel companies, recovering from a terrible 1978 first quarter, reported a 4,282 percent profit improvement. Nonferrous metals were up 352 percent; railroads, 190 percent, the paper industry, 100 percent. A bad year for trees.

However, American corporations as a whole had an estimated 28.5 percent increase in profits in the first quarter of 1979, compared with the first quarter of last year. The oil industry's 56.9 percent increase was almost exactly twice that.

Some people argue that even the 28.5 percent increase was too much, not having done that well themselves. It is certainly making it harder for Carter to persuade labor unions to accept 7 percent wage increases. There's that word getting around again.

There is no question that the sensational jump in oil costs originated with the huge price increases decreed by the Organization of Petroleum Exporting Countries. Energy inflation began with the oil cartel. As St. Matthew said, the end is not yet.

The question is whether the oil companies have simply passed on the OPEC price increases unchanged, in which case the cartel would be the only villain in the piece, or whether the oil industry has been adding on a little something for itself. A soupcon, as it were.

"If they were only passing it on, then their profits wouldn't be going up," says Robert S. McIntyre, director of the Tax Reform Research Group of Public Citizen, a Ralph Nader organization. "But it obviously isn't just a passthrough. They (the oil companies) are way ahead of inflation, and they're part of the cause of inflation."

Although the oil industry's profitability lagged slightly behind the overall manufacturing average in 1978, most oil companies zoomed ahead of the average in the first quarter of this year.

Sohio's rate of return on investment was 33 percent, McIntyre said. Amerada Hess Corp.'s rate of return also was 33 percent; Marathon Oil Co., 29 percent; Continental Oil, 20 percent; Mobil, Standard of Indiana and Phillips, 19.5 percent each; Exxon, 18.8 percent; Standard of California, 17 percent.

But among those who know the oil industry best, it is a matter of little importance whether the industry's reported profits are above or below average. This is because, in their opinion, some of its finest profits are never reported.

"Oil company-reported profits are extremely biased—seriously distorted," says a government oil expert. "The industry uses a variety of accounting methods—all perfectly legal—to reduce its profits before it reports them."

This official, who does not work for Secretary Schlesinger, estimates that in just one area, the oil industry has been understating its earnings by about \$5.5 billion a year, and perhaps by \$11 billion or more. This involves the increase in the value of its oil reserves as a result of the OPEC price increases.

"When the price of oil goes up, the value of proven reserves in the ground and off-shore also increases," the official pointed out. "This is not reported anywhere by the oil companies."

"The Securities and Exchange Commission has proposed that the companies be required to use the RRA accounting method—reserve recognition accounting. If the increase in the value of reserves was included, there would be a huge increase in earnings."

Between 1973 and 1978, the world price of oil rose from about \$3 a barrel to about \$14 a barrel. The official suggests that a conservative weighted average increase over that period would be \$4 a barrel.

The United States now has proven oil reserves of 27.8 billion barrels. An increase of \$4 a barrel in the value of these reserves would total \$111 billion. Inflation works in mysterious ways its wonders to perform.

Spread out over a 10-year recovery period, this would mean a yearly increase of about \$11 billion in actual oil company earnings. To be very conservative, and to take into account higher production costs resulting from inflation, the government specialist divides this in half.

Using an accounting method known as the "successful efforts" method, major oil companies capitalize successful drilling projects and treat unsuccessful drillings as an expense—deducting this from gross income. This reduces their reported profits.

Using another accounting procedure, oil companies immediately amortize the cost of acquiring leases on nonproductive oil fields, especially offshore fields. There are a lot of accounting methods.

The Federal Trade Commission's Bureau of Competition has estimated that these two accounting procedures saved the nation's 18 largest oil companies a

total of \$2 billion in 1975. In that year, the oil industry's net reported income was about \$5.7 billion. The FTC bureau said it should have been at least \$7.7 billion. Picky.

In 1973, major oil companies switched from an inventory accounting method known as Fifo (first in, first out) to another procedure known as Lifo (last in, first out). This was just at the time when the OPEC price increases were beginning to drive up the value of oil held in inventory and oil in onshore and offshore reserves. Coincidence is part of life.

The result of the accounting switch was that oil purchased at an earlier date was held in inventory longer while its value went up and up as a result of the OPEC increases. By not selling the older but now much more valuable oil, the companies held down their profits.

According to Form 10-K reports filed with the SEC, the switch from Fifo to Lifo reduced Exxon's inventory profits by almost \$2.3 billion from 1974 through 1976. Shell reduced its inventory profits by \$384 million in the same period, Mobil by \$820 million, and Phillips by \$245 million.

Another result of all this is that the large oil companies are swimming in a sea of cash. Edwin Rothschild, research director of the Energy Action Educational Foundation, says major oil companies now generate 70 to 80 percent of the cash they need internally.

In 1978, Rothschild says, Standard Oil of California generated 101 percent of its funds internally; Texaco, 96 percent; Standard Oil of Indiana, 90 percent; Exxon, 83 percent; Gulf and Shell, 77 percent each, and Mobil, 72 percent.

This means the big oil companies don't have to borrow much money to help finance exploration for new oil supplies, or to buy other companies. Neither a borrower nor a lender be, said Polonius. Maybe he owned an oil company.

"Exxon is buying copper mines in Chile, coal mines in Australia and uranium in Canada," Rothschild said. "Mobile just bought the General Crude Oil Co. for \$800 million, and it offered \$550 million in cash for the Bodcaw Co.," a wood products company.

The announced purpose of Carter's decontrol decision is to encourage the oil companies to explore for new supplies of oil. Will they do it? A government oil specialist says the oil companies have spent only about half of the increased operating income that they made between 1973 and 1975.

In addition to all the money they have lying around, they could go to the banks and use the value of their oil reserves as collateral for exploration loans, he said. If you were a bank, would you lend money to an oil company?

"Yet the major oil companies scream that they need more money for exploration," the official said.

The oil companies, Rothschild points out, have been saying since 1973 that the price of domestic crude oil must be decontrolled in order to give them an incentive to explore for new oil reserves.

In 1972, the United States's proven reserves of oil were 36.3 billion barrels. At the end of last year, they were 27.8 billion barrels. This was a decrease of 23.4 percent. It was almost the only thing that went down.

[Whereupon, at 6:05 p.m., the hearing was adjourned, the subcommittee to reconvene subject to the call of the Chair.]

[By direction of the chairman, the following communications were made a part of the hearing record:]

STATEMENT BY THE AMERICAN JEWISH COMMITTEE ON DOMESTIC OIL DECONTROL,  
AND RELATED ENERGY MATTERS

The American Jewish Committee appreciates this opportunity to present its views on energy policy issues of utmost concern to us. The American Jewish Committee, founded in 1906, is the oldest human relations organization in the United States. Its 40,000 members—of every political persuasion—are leaders in their communities across the country.

We believe that the reduction of U.S. dependence on unstable Persian Gulf energy sources is of utmost national priority. The development of an effective, U.S. energy policy is essential to the economic and social well-being of our country, to our national security, to the maintenance of an independent U.S. foreign policy, and to world stability.

As one of the pioneer agencies in the field of intergroup relations, we are concerned that the curtailment of U.S. economic growth caused by domestic energy

shortfalls could well exacerbate group tensions over a shrinking economic pie. We believe that energy decisions will determine whether we have an expanding or contracting economy.

We recognize that there are no quick-fix or painless solutions to reduce our domestic energy shortfall. The United States must intensify its efforts to expand all domestic energy sources, to conserve available supplies, to develop alternate non-depletable energy, and to encourage exploration and production of energy in non-Persian Gulf countries. The solutions require concerted incremental efforts which may mean making tradeoffs in higher costs and in lower environmental standards.

Present U.S. energy policies, however, hold down domestic oil prices to levels which inhibit greater production, increase U.S. dependence on OPEC oil, while we pay OPEC's extortionist prices and watch the loss of American dollars and jobs to foreign countries. It is a simple economic fact that a high price paid to a domestic oil company for domestic energy production benefits the U.S. economy. The same high price paid to a foreign country benefits its economy and may have a negative impact on our own.

We therefore support the Administration's proposal for gradual deregulation of domestic oil prices. (Text of March 20th statement attached.) We recognize that there is no guarantee that higher prices will result in significant conservation or, in the short term, in more than marginal increases of domestic production. However, we believe that in the intermediate term there will be an appreciable augmentation of domestic supplies over what would have existed without decontrol.

We believe that it is essential that any "windfall" tax on company profits from decontrol be accompanied by provisions that will ensure that the increased revenues permitted to the beneficiary companies are indeed used by them for investment in the various means available to increased domestic energy supplies. We believe that it is not good enough to merely *urge* the industry to reinvest but that there ought to be very strong incentives so that it will do so and equally strong penalties—presumably tax penalties—if it does not. One means of accomplishing this would be through a plowback provision.

Certainly, the poor should not be made to bear a special burden as a result of the ever increasing price of energy. Government subsidy for such costs for the poor and the elderly on low fixed incomes must be provided. But the precipitous price spiral will continue unless we can produce more domestic energy, conserve more, and develop more powerful methods of dealing with OPEC in the commercial oil marketplace.

While the Administration has attempted to deal with important aspects of our domestic energy problem, we believe that Congress must take the initiative in combatting OPEC's price setting powers through changes in the commercial mechanisms by which oil is imported. Greater government regulation on the international side of the problem should go hand-in-hand with the regulation on the domestic side. A major priority is the removal of foreign tax credits for oil produced by American companies in OPEC countries. (The removal of all foreign tax credits might impede energy development in non-OPEC countries.) Other measures include the imposition of an import quota on all foreign oil, except that in the Western Hemisphere (thereby creating a Western Hemisphere Energy Free-Zone) and the use of a sealed bidding technique to allocate imports within that quota.

The U.S. must also diversify its sources of oil imports. U.S. aid to increase exploration and development in nearer and more stable parts of the world, particularly in the Western Hemisphere, would make the world oil market more competitive. We support a variety of proposals to encourage diversification including the use of allocation of the U.S. oil market as incentive for development and exploration in non-Persian Gulf countries; greater U.S. support for World Bank financing of oil exploration in the LDCs; the establishment of an energy development facility within the Export-Import Bank of the United States (Hyde Bill H.R. 1965); the establishment of risk insurance for exploration in less stable parts of the world; and U.S. aid for heavy oil exploration and processing outside the U.S., particularly the Western Hemisphere.

The American Jewish Committee further believes that strong mandatory conservation measures are necessary to reduce the demand side of the equation. (Text of our March 20 statement calling for such measures is attached.)

None of these proposals alone will free us completely from OPEC's hold on world oil prices and supply. But together they could significantly change OPEC's ability to raise prices at will.

STATEMENT BY THE AMERICAN JEWISH COMMITTEE ON ENDING PRICE CONTROLS  
ON DOMESTIC OIL

In its previous statements on energy, the American Jewish Committee has urged policies designed to reduce U.S. consumption, increase domestic production and lessen U.S. dependence on foreign energy sources. The recent oil cutback by Iran and Arab threats to use oil as political blackmail have underscored our concern about the deficiency of energy production in the United States. We consider the alleviation of this problem to be of the highest priority. If policies are enacted to increase domestic energy production, the United States has a chance to ensure its economic and social well-being, its national security, and its independent foreign policy.

As far as domestic oil policy is concerned, the American Jewish Committee believes it is short-sighted to continue to hold down domestic oil prices and therefore production, while at the same time increasing our dependence on OPEC oil, paying its extortionist prices and watching the loss of American dollars and jobs to foreign countries.

Any solution to the problem of deficient domestic oil production should encourage both increased domestic production and reduced U.S. consumption. These twin goals, we believe, can be met through the pricing mechanism.

The American Jewish Committee therefore believes that President Carter should immediately begin the process of deregulation of the prices of all domestic oil as permitted under present law. So as to minimize any possible inflationary impact, the American Jewish Committee would support a gradual decontrol to be completed in the next several years.

We urge that the President's plan include tax provisions to prevent windfall profits and ensure that the increased proceeds from deregulation are reinvested by U.S. energy companies in exploration, development, and production of energy.

Moreover, we recognize that higher energy prices may place a special burden on the poor and the elderly on low fixed incomes, and therefore we urge the President and Congress to consider favorably any one of the many plans that have been suggested to remedy this problem.

Adopted by the AJC Board of Governors, March 20, 1979.

STATEMENT BY THE AMERICAN JEWISH COMMITTEE ON  
MANDATORY CONSERVATION

The recent oil cutoff to the U.S. by Iran has served to underscore the American Jewish Committee's view, expressed in its previous energy statements, that the U.S. must decrease its reliance on overseas energy sources. Energy conservation is one of the most effective ways to accomplish this end. Unfortunately, voluntary efforts at conservation have been largely ineffective.

Emergency standby plans will be called into effect by the President as needed, but the American Jewish Committee believes that the U.S. must get down to the business of saving energy by mandatory conservation measures which will continue over the long term and which will have a substantial impact on the energy habits of this nation.

The American Jewish Committee, therefore, urges the prompt implementation by the Department of Energy, the Administration and Congress of the mandatory conservation measures which have been in preparation for several years and which are still not in effect. Such measures include setting energy efficiency goals for consumer products; regulations for residential, commercial and federal buildings; weatherizing individual dwellings; financial and technical assistance programs for energy conservation for schools, hospitals, municipal buildings; and programs to monitor consumption in plants as well as residential audits.

Some long-term mandatory conservation measures are already in place, such as automobile mileage efficiency standards. But the American Jewish Committee believes that consideration should be given to stricter measures, including expansion of mileage standards to include trucks and recreational vehicles, as well as imposition of automobile weight restrictions. It also urges that efficiency standards on consumer products be set so that they are economic over the life cycle of the product.

The American Jewish Committee further urges that the federal government provide greater incentives for the use of mass transportation and for state and city planning to conserve energy.

The American Jewish Committee recognizes that some mandatory conservation measures may result in increased cost to the consumer, placing a burden on low income families. The American Jewish Committee, therefore, supports the variety of plans proposed to supplement the cost of such measures for the poor and for the elderly on low fixed incomes.

Adopted by the AJC Board of Governors, March 20, 1979.

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HERMAN & HELEN'S MARINA,  
Stockton, Calif., May 27, 1979.

MICHAEL STERN,  
Staff Director, Committee on Finance, Room 2227, Dirksen Senate Office Building,  
Washington, D.C.

DEAR MR. STERN: To say that the removal of artificial price controls gives the oil companies windfall profit is a misnomer in the first place. It is obvious to any high school student with a rudimentary acquaintance with the concept of the law of supply and demand that if you impose artificial government controls to hold down the price of oil to a level that has no relationship to the supply, you will cause an increase in demand and a decrease in supply. The present shortages are entirely the result of the artificial price controls so irresponsibly imposed by the government. There is no legitimate reason for Americans to pay one third to one half the price of gas elsewhere in the world. The faster we return oil to a free market situation, the faster we will end the shortages and reduce our nation's inexcusable dependance on foreign oil.

In order for the Oil Industry, and all of the potential developers of alternative energy sources to move ahead with development of the resources necessary for the preservation of our country and the high standard of living we now have, it is essential that the government remove all controls and restrictions, forget the ridiculous idea of a windfall profits tax, and make a commitment to America to allow the free enterprise system to restore our ability to provide the energy necessary for our continued high standard of living.

At the present time we have numerous tax laws which are designed to encourage the production of oil, and the development of other energy sources. It would be more appropriate to remove the depletion allowance, or change rules for deductibility of development expenses or eliminate the investment of tax credits on oil development than to impose a whole new tax which nobody will understand until after ten years of legislation, and which really has no legitimate purpose in the first place. The present tax laws are far too complicated. The removal of provisions of current law is a much more constructive method of changing government incentives for or against oil development than the addition of new laws which make everything more complicated.

Yours very truly,

DAVID M. SMITH.

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BEVERLY HILLS, CALIF., May 24, 1979.

Mr. MICHAEL STERN,  
Staff Director, Committee on Finance,  
Room 2227,  
Dirksen Senate Office Building,  
Washington, D.C.  
To the Senate Finance Committee:

GENTLEMEN: The following are my views on the "Windfall Tax Legislation" I do not see any effect of this proposed legislation except to increase the cost of oil and gasoline in the United States. It certainly will not, as far as I can see, make available more gasoline. It would certainly be appreciated if the Congress could do something besides pass more tax laws which, though purportedly are being placed upon the producer, as we know ultimately will be paid by the taxpayers. Further, I fail to see why by these methods we should be subsidizing foreign oil producers to the detriment of ourselves. What we need are less taxes and less government regulations.

Yours very truly,

NEIL D. MCCARTHY.

JUD NOBLE & ASSOCIATES, INC.,  
Columbus, Ohio, May 21, 1979.

*Subcommittee on Energy and Foundations:*

GENTLEMEN: We submit the following statements for your consideration in regard to President Carter's proposed 50 percent excise tax on crude oil production.

A. There is a great distinction between "major" producers and "independents". Independents depend solely on oil and gas production for income and do not have income generated by pipelines, refineries, and marketing as do the "majors".

B. The majority of oil and gas wells in the continental United States are drilled and produced by "independents".

C. The existing tax structure on oil and gas production is adequate and was apparently satisfactory until supplies of crude oil tightened.

D. Any additional taxation of crude oil and/or natural gas will not cause more exploration, development and resultant production of these vital resources.

It appears however, that our present Administration and Congress believe taxes are a cure for every ailment of the United States citizen and business community. Therefore, since the 50 percent excise tax is expected to solve the dilemma of shrinking crude oil supplies at a higher cost, we advocate and recommend the following modifications to the proposal.

1. No tax on "stripper wells". This country cannot afford to have any production plugged for salvage. Any tax would decrease the revenue on these marginal wells and cause them to be plugged earlier than if there were no tax. This lost production would have to be replaced by even higher cost oil and less reliable foreign imports.

2. No differentiation between "new oil", "old oil". It all refines the same. Likewise reduce the many categories/classifications of oil now in effect.

3. At the very least, establish an exemption in the range of one million dollars with a "plow back" provision on all taxable oil.

4. De-control all secondary recovery and tertiary oil production.

5. Eliminate or reduce the cash bonus and excessive royalty payments demanded by our government for exploration and development of federal lands and dominion.

6. Make a diligent effort to reduce the paper work involved in any legislative proposal (not like the NGPA). The money should go for drilling, not administration.

All things considered, incentive is what makes a person progress and made this country grow. Taxes are not an incentive, investment toward anticipated profit is.

It has been our experience, and continues to be, necessary to borrow from lending institutions to our maximum capability to finance our exploration program. An added tax on crude oil will only serve as a deterrent to future oil and gas exploration and development that is so badly needed.

Respectfully submitted,

JUD NOBLE, *President.*

OIL PRICE DECONTROL AND WINDFALL PROFITS TAXES: A PRELIMINARY  
ASSESSMENT

(By James E. Jonish, Professor of Economics and Chairman; Theodore J. Taylor, Associate Professor of Economics, Department of Economics, Texas Tech University, Lubbock, Tex.)

INTRODUCTION

The modifications to the national energy policy that were announced by President Carter on April 5, 1979 will impact on energy demand and supply in several respects. In general, the modifications represent viable and economically efficient approaches to the resolution of the Nation's problems associated with energy production and use. Their quantitative importance remains to be determined, however.

The program has two major components, and several minor components. The major components are (1) the phased decontrol of domestic crude oil prices, and (2) a short-term windfall profits tax on oil producers, and creation of an Energy Security Trust Fund (ESTF). The minor components include various voluntary and mandated energy conservation measures, and proposals to alter the distribution of existing oil supplies.

### *Decontrol of Domestic Crude Oil Prices*

We support the proposal to decontrol crude oil prices. First, macroeconomic effects of decontrol will be slight and will be short-lived. The inflation rate will be only slightly higher, real output will be only slightly lower or unchanged, and the unemployment rate will be essentially unchanged. Moreover, the dollar will appreciate in international exchange, and the balance of payments will improve. Second, the decontrol program will restore energy prices to market-clearing levels, and will allow the market system to operate freely to generate an efficient allocation of resources. Third, all energy technologies will be evaluated in terms of benefit-cost ratios that are reflective of the true opportunity costs involved, and the efficiency of long-term energy supply alternatives will be increased.

### *Windfall Profits Tax*

We can support the windfall profits tax proposal only if it contains a plowback clause that will exempt from the tax any profits that are used to engage in energy-related investment. There are several reasons for our position. First, the oil industry's profit rate (measured as return to equity) is approximately the same as that for basic industry in the United States. Second, the plowback provision will stimulate investment that will increase the productivity of the economy. Third, the price-production-profits condition of the oil companies has been determined in large part by misguided Federal policies, and the companies should not be made to suffer from actions that correct public policy errors.

On grounds of equity, it is generally agreed that low income persons are deserving of higher incomes through the receipt of transfer payments. Part of the receipts of the windfall profits tax are to be allocated to the poor to relieve the burden of higher energy costs. However, all additional costs to the poor caused by unanticipated price increases reduce their real incomes, and we see no particular reason why reductions associated with increases in the price of energy require special attention.

### *Other Energy Proposals*

We support the President's proposals for voluntary energy conservation actions only because they might serve to focus public attention on an important problem. We believe that individuals react more to incentives and disincentives that are provided through the market mechanism, than they do to appeals to patriotic spirit. Consequently, we believe that energy conservation will be achieved through the changes in the relative real price of energy that will occur as a result of the decontrol program.

Based upon the President's recognition of environmental-energy tradeoffs, we support major research effort into the impact of environmental standards on the development of new energy supplies in a cost-benefit framework.

## I. OVERVIEW

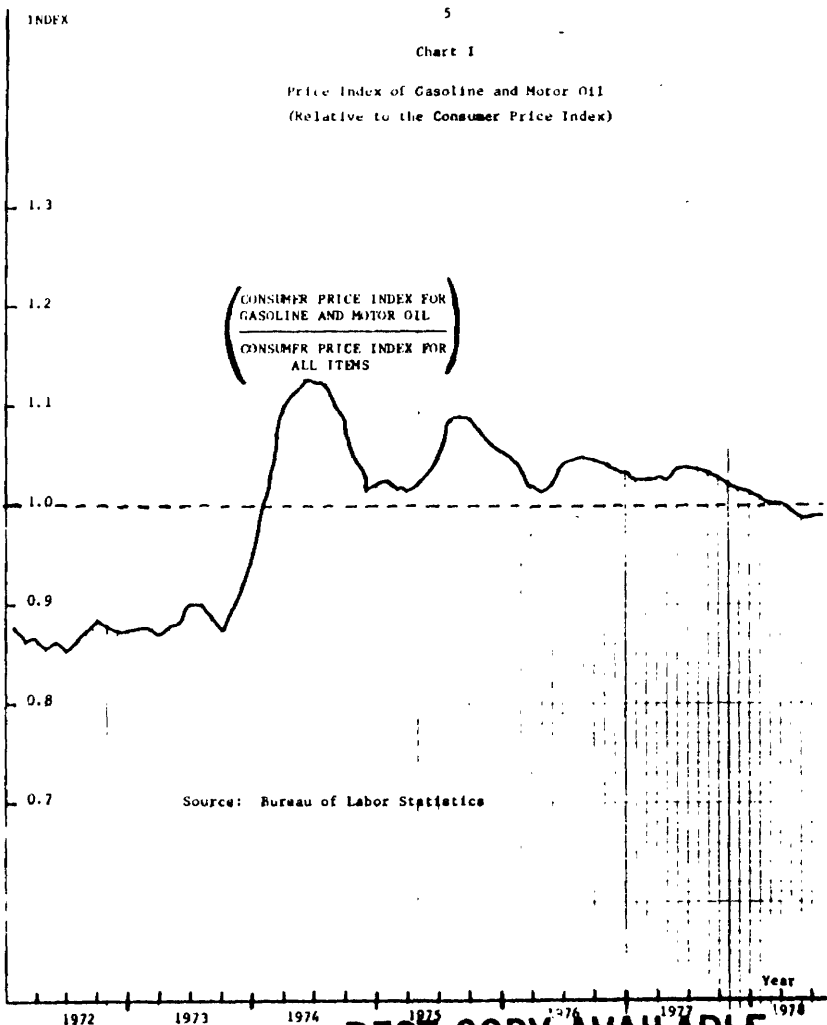
With dramatic clarity, the OPEC oil embargo of 1973, and the subsequent quadrupling of world oil prices in 1973-74 introduced the energy problem into the mainstream of U.S. policy concerns. Presidents Nixon, Ford, and Carter have all dealt with the energy problem in various policy recommendations over the past several years.

Support for President Carter's recent proposal on decontrol assumes that the energy problem is in large part due to a failure of current relative price levels and price regulations adequately to reflect the increasing real cost of domestic energy supplies and the increased market power of the OPEC nations. The proposed higher prices of domestic crude oil are thus part of the energy solution, not part of the energy problem. Higher prices should encourage increased domestic production of crude oil and increase the economic feasibility of energy alternatives, while encouraging and rewarding conservation by consumers of oil products. Phased decontrol will ensure that the costs of adjustment to higher prices will occur gradually, preventing severe shortrun dislocations.

The increases in the real price of energy will result in differential impacts of different income groups, oil producers, oil consumers, regions, and industries. Thus, allowing higher prices through decontrol of crude oil appears to be a more serious political than economic problem. Political considerations might require the use of a rebate of some government revenues to low income households (or a per capita refund to all persons), and grants-in-aid to temper regional dislocations. An excess or windfall profits tax with a 100 percent plowback provision would encourage the oil industry to utilize the short-term windfall gains for exploration and production.

Through complex natural gas price regulations, crude oil pricing practices, and changes in the depletion allowance, as well as other government policies, domestic drilling and oil production have declined in recent years, and the sharp price increases in 1973-74 imposed by OPEC were translated into higher gasoline and motor oil prices relative to other prices in the Consumer Price Index (CPI). Chart I illustrates the behavior of retail gasoline and motor oil prices relative to the CPI for the years 1972-78. The index jumps from .90 to 1.08 from 1973 to 1974, but then slowly declines to approximately 1.00 at the end of 1978, in spite of the need for energy independence, rising real energy costs and the need to develop energy alternatives. Based on the 1974 index (1.08), and gasoline prices at the pump of 60-65 cents per gallon in 1974, the price of gasoline at the beginning of 1979 would have had to be 79-86 cents per gallon to retain the same real price differential over the CPI that existed in 1974. In short, regulated domestic oil prices and the domestic inflation during 1974-78 have eroded the real price of oil and gasoline products again. Oil products have again become relatively inexpensive with the resulting disincentives to production and conservation.

Even OPEC-determined world oil prices have not kept pace with the increase in the CPI since 1974. The nominal OPEC base price rose some 11.2 percent between 1974 and the planned increases in the first quarter of 1979, prior to the Iranian revolution. In contrast, the U.S. CPI increased by 37.4 percent from 1974 to the end of 1978, resulting in a reduction in the real OPEC base price.



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The net effects of low absolute and declining relative prices on oil and gasoline products have been to provide a subsidy to consumption, to discourage the domestic production of crude oil and alternative sources of energy, and to postpone serious consideration of solutions to the energy-related problems. As shown in Table I, the United States' merchandise balance with the OPEC nations deteriorated from 1975 to 1978, despite the official recognition of an "energy crisis."

TABLE I.—MERCHANDISE BALANCE, TRADE WITH OPEC NATIONS, SELECTED COUNTRIES, 1975 AND 1978

Country:	Balance		Change 1975 to 1978
	1975	1978	
United States.....	-7.9	-16.1	-8.2
Japan.....	-11.0	-10.1	+ .9
West Germany.....	-1.4	+2.6	+4.0
France.....	-4.5	-5.1	-.6
United Kingdom.....	-2.4	+2.0	+4.4
Italy.....	-4.1	-2.5	+1.6
Canada.....	-2.7	-2.0	+ .7

Source: Caton and Rogers, table 4.

Deregulation of crude oil prices can be expected to yield the opposite effects with a consequent reduction in dependence on foreign oil sources and the instability in the U.S. economy based on exogenous shocks from actions of energy producing nations.

## II. DECONTROL OF CRUDE OIL PRICES

The Energy Policy and Conservation Act of 1975 gives the President discretionary authority to determine the rate of domestic crude oil price increases after May 31, 1979. President Carter has chosen a program of phased decontrol of crude oil prices, designed to increase domestic prices to world market levels over a 28-month period. This will affect nearly two-thirds of currently produced domestic oil, although only one-third of domestic consumption because of the high volume of U.S. oil imports.

The result of decontrolling crude oil prices will be (a) to allow price to serve its allocative function on the demand side of the market, and (b) to act as a stimulus to domestic production of crude oil and substitute energy products. Whether competitively determined or not, market prices allocate scarce information about market conditions (i.e., increasing resource scarcity) in an efficient manner. By contrast, controlled prices distort information about market conditions:

"Controls do perceptibly undermine the economy's efficiency . . . They necessarily screen much of the information content from price signals, making it difficult to get resources allocated to their most desirable use. (Gigante, p. 1.66)."

### *General effects of decontrol*

Higher real prices of oil and natural gas can be expected to have the following effects in the short run. These effects should be interpreted as the required adjustments from a disequilibrium market state to an equilibrium market state. The effects are to

1. Decrease the quantity of oil and gas demanded, and increase the quantity supplied from existing wells;
2. Increase the demand for substitute energy sources;
3. Decrease the demand for imported oil, with a subsequent improvement in the value of the dollar and the U.S. balance of payments;
4. Cause the economy to operate at a slightly slower rate of growth, with lower real GNP and a higher unemployment rate;
5. Cause the general price level to increase, but substantially less than the increase in the prices of oil and gas;
6. Increase the revenues to government through increased severance and income taxes.

In the long run there will also be several effects of decontrol. Again, these effects represent normal market responses to changes in the economic environment. These effects are to

1. Increase the supply of oil and gas through increased exploration, and through development of enhanced recovery methods;

2. Increase the development of alternative sources of energy and increase their economic feasibility;
3. Lower the rate of increase in general price level through increased economic efficiency;
4. Decrease slightly the rate of growth of the economy through the substitution of labor for capital and energy in the production process.

#### *Extent of adjustments under decontrol*

The anticipated increases in the real price of oil under the decontrol program, as compared with the existing policy, are minimal. Under the Energy Policy and Conservation Act of 1975, crude wellhead price increases of approximately 10% per year are allowed until 1985. Given the assumptions of OPEC price behavior, it has been estimated by the Congressional Budget Office that the average refiner's acquisition cost of crude oil will be 6.8% higher in 1985 under the decontrol program than under the current policy. Moreover, as illustrated in Table II, after the first two years there are only slight increases in the real price of crude oil.

TABLE II.—AVERAGE U.S. REFINER'S ACQUISITION COST OF CRUDE OIL, PERCENT CHANGE PER YEAR

(In percent)

Year	Current policy		Phased decontrol	
	Nominal	Real	Nominal	Real
1980.....	9.2	3.2	15.2	9.2
1981.....	8.4	2.4	13.0	7.0
1982.....	8.4	2.4	8.8	2.8
1983.....	8.6	2.6	6.9	.9
1984.....	8.4	2.4	6.9	.9
1985.....	8.4	2.4	6.8	.8

Note: Real changes were determined by subtracting from the nominal changes an assumed general inflation rate of 6 percent per year.

Source: Calculated from Rivlin, letter, table 1.

#### *Perspectives on Inflation*

Inflation is the process of increases in the general price level. In a pure inflationary process, all prices rise at the same rate. In short-run periods of time, some prices might increase and others might decrease, due to differences in relative scarcities. Conventional measures of price changes, e.g., the Consumer Price Index and the Producer Price Index are fixed-weight indicators, and will indicate increases whenever there is an increase in any component of the index. Because of the fixed weights, no substitution from those items that are rising more rapidly in price is allowed. Thus, the measured change in the various price indices should be considered as the upper bound of any inflationary impact on the consumers of oil products. All of these indices will record increases under the oil decontrol program.

The contribution of oil price decontrol to inflation has been estimated by Chase econometrics, Data Resources, the Congressional Budget Office, and Continental Oil Company, among others. The anticipated impacts are generally small, and are due to the following factors:

1. Gasoline prices and retail heating oil prices are a small portion of the CPI (4.2 and 0.9 percentage points respectively);
2. Crude oil costs are only 44 percent of retail gasoline prices and 62 percent of retail heating oil prices;
3. Domestic oil prices that are now controlled represent only 33 percent of total current consumption.

Other sectoral disturbances (union wage settlements) or government policies can add as much or more to the aggregate inflation rate as will the decontrol of oil prices, yet usually do not attract much attention. For example, current increases in the social security tax, minimum wage and unemployment insurance taxes will add 0.4 percentage points to the inflation rate in 1979 alone, according to Data Resources estimates (Eckstein, p. 1.4). Nevertheless, these policies should be pursued if they are viewed as being in the national interest.

It must be remembered that long run sustained inflation is an aggregate monetary phenomenon. It can be and has been caused by spending in excess of available aggregate supply at prevailing prices, supported by monetary growth.

Recent federal deficits supported by near double-digit monetary growth have caused the inflationary problems of recent years. As can be seen in Table III, monetary growth in excess of real output growth has been associated with higher inflation rates.

Price increases for primary energy will restore near equilibrium conditions that prevailed in 1973-74, and will approach the equilibrium factor price ratios and output shares that existed prior to World War II. For example, it has been estimated that the share-elasticity of nonrenewable resources, which is the ratio of the value of mineral resource inputs to the Gross National Product, "averaged about 0.05 in the first thirty years of the century, and rarely fell below 0.045. Since the end of the second war, the value of this ratio has trended slowed downward to about 0.035 or less in the early 1970s. (Solow, p. 10)."

TABLE III.—CHANGES IN MONEY STOCK, REAL OUTPUT, AND PRICES, 1973-78

Year	Money stock (M, billions)	Percent change	Real GNP (billions 1972)	Percent change	GNP deflator (1972=100)	Percent change
1973.....	\$571		\$1,235		105.8	
1974.....	612	7.2	1,218	-1.4	116.0	9.6
1975.....	665	8.7	1,202	-1.3	127.2	9.6
1976.....	740	11.3	1,271	5.7	133.8	5.2
1977.....	810	9.4	1,333	4.9	141.6	5.8
1978.....	872	7.6	1,385	3.9	152.1	7.4

Source: "Economic Report of the President, January 1979," tables B-2, B-4, and B-59.

#### *Nonprice Benefits of Decontrol*

If producers are allowed to charge market clearing prices for oil and gas, some costs of production will decrease. There are several factors that will contribute to this cost reduction; (1) expenditures by firms for litigation will decrease; (2) well opening and closure will not be forced to respond to changes in administered prices or other regulations; (3) the disruptive effects of the two-tier pricing policy and the entitlements program will no longer be present; (4) administrative and accounting costs of regulation will no longer be present. These benefits should be considered in evaluating the proposed policy.

#### *Estimates of Macroeconomic Effects of Decontrol*

Using estimates of the price elasticities of demand supply of oil with various macroeconomic scenarios, the decontrol phase-in schedules, and energy investment outlays, the macroeconomic effects of decontrol can be estimated. Simulations conducted by Chase Econometrics, Data Resources, and the Congressional Budget Office have been reported. Their findings for the 1979-84 period are summarized in Table IV. Briefly, the findings are:

1. Inflation will be slightly higher under decontrol, with the Consumer Price Index being 0.1 to 0.3 percentage points higher each year in the period 1979-81
2. Real output, measured by Gross National Product, will be slightly lower or unchanged under decontrol, being no more than 0.1 percentage points lower.
3. Unemployment will be virtually unchanged.

Decontrol will decrease the demand for imported oil, and will eventually put downward pressure on the aggregate price level. Both of these factors will stimulate the economy. Moreover, an improvement in the balance of payments of \$3-7 billion is expected by 1981.

Simulations conducted with general equilibrium models of the economy, in which long-run adjustments can be made, likely would produce macroeconomic effects that are smaller than the ones just mentioned. This is due to the greater substitution possibilities inherent in these models.

TABLE IV.—MACROECONOMIC AND ENERGY SECTOR IMPACTS OF PHASED DECONTROL, DIFFERENCE FROM CONTROL SOLUTION

	CEA	Chase	DRI	CBO
<b>Inflation rate (percent):</b>				
1979 .....	+0.1	+0.1	NA	+0.1
1980 .....	+2	+4	+3	+3
1981 .....	+2	+3	+3	+3
<b>Real output (percent):</b>				
1979 .....	-.1	+1	NA	0
1980 .....	-.1	0	0	0
1981 .....	NA	-1	0	0
<b>Supply of oil (million barrels per day):</b>				
1979 .....		+0.1	0	NA
1980 .....		+2	+2	NA
1981 .....		+4	+4	+2
<b>Demand for oil (million barrels per day):</b>				
1979 .....		0	NA	NA
1980 .....		-1	NA	NA
1981 .....		-2	NA	-1
<b>Net foreign balance (billions):</b>				
1979 .....		+\$4	NA	NA
1970 .....		+\$1.4	+\$2.9	NA
1981 .....		+\$2.8	+\$6.6	NA

Sources: CEA: Schultz. Chase: "The Iranian Revolution" and Zamzow. DRI: Rogers. CBO: Rivitin, Letter.

For example, Hudson and Jorgenson found that, when compared to a base case, a policy similar to the one now being proposed would cause energy prices to increase by 12.5 percent, and energy use to decrease by 15.9 percent over a base case that involves no sharp price increase of crude oil. However, real investment decreased by 4.9 percent, and the growth rate of GNP decreased from 3.2 percent per year to 3 percent per year, a decrease of 6.25 percent (Hudson and Jorgenson, Tables 1 and 3). There was evidence of a tendency to substitute labor for capital.

#### *Energy sector effects of decontrol*

The impact of the decontrol program on the energy sector will be felt most strongly in the oil, natural gas, and coal components. The increase in price of oil and gas will not be sufficient to provide a major stimulus to the increased development of solar, geothermal, or other alternative energy technologies. However, with decontrol, the economic feasibility of such alternatives will no longer be penalized as they are now. In the future the economic feasibility of alternative technologies can be determined on the basis of market-determined benefits and costs.

Estimates of increased supply of petroleum by 1981 under decontrol vary considerably, from the +0.2 MMBD estimate of the Congressional Budget Office, and the +0.4 estimate of Chase and DRI, to the +1.1 MMBD estimate of the Continental Oil Company. These estimates can be increased by about one-half due to the associated natural gas that will be produced. Estimates of decreased demand by 1981 have a narrower range, and usually are approximately -0.2 MMBD (CBO and Chase). Given current consumption and production levels, these estimates suggest low price elasticities of demand and supply.

Further decreases in demand can be expected from the various energy conservation measures now being proposed. Further increases in supply can be expected through increased investment in the industry, although no analysts suggest more than a reduced dependence on foreign crude oil as a result.

## III. EQUITY AND WINDFALL PROFITS

While the decontrol program is argued on efficiency grounds, the imposition of a windfall profits tax is argued on equity, and perhaps political, grounds. The additional government revenues attributed to decontrol (both regular and windfall profits taxes) are proposed for the establishment of an Energy Security Trust Fund (ESTF). The Fund will rebate revenues to low income households, encourage mass transit, and encourage the development of alternative sources of energy supply through tax credits, loan guarantees, and research activities.

The major cost of decontrol involves its income redistribution effects. Higher oil prices would place an additional burden on low income households already harmed by the unanticipated inflation brought about by federal government monetary and fiscal policies. In addition, there will be a windfall gain transferred to domestic oil producers from consumers and OPEC producers through higher prices for domestic oil. Another windfall recipient is the federal government through increased corporate profits tax collections.

Within the United States, the windfall gain from consumers to domestic producers could be addressed in a number of ways, including a short-term excess profits or severance tax. The resulting revenues could be used to rebate the impact of higher prices on low income households, or for all households on a per capita rebate basis.

It should be pointed out, however, that redistribution of the windfall gains or excess profits from producers to consumers will remove one of the advantages of decontrol. The anticipated higher prices and the resulting increased net income of producers will act as the incentive to further exploration and production of domestic crude oil. However, an excess profits tax with a complete energy investment plowback provision would encourage the desired supply side response by producers, cause a shift toward greater investment spending, and might be expected to maintain the rate of growth of real GNP and lead to an improvement in productivity trends.

The level of the windfall profits tax appropriate to maximum petroleum exploration and development has not been determined. However, the Congressional Budget Office has estimated that the proposed tax would allow two-thirds of all exploration in 1979-81 to be financed from internal cash flow, and that it might even be possible to increase the tax without discouraging exploration (Rivlin, Testimony, pp. 9-11.)

While the plowback of additional profits into investment in the energy industry might increase nonresidential fixed investment by as much as four percent, when compared to existing levels, such investment will have a long gestation period. First, the ability of the capital goods sector to expand production in the short run, even the production of drilling rigs and equipment, might be limited by existing capacity. Second, investment in new refineries or generating plants might require as much as ten years before completion.

The windfall tax-plowback provision would institutionally encourage exploration and drilling activity for crude oil as well as other energy alternatives. According to DRI estimates, under the decontrol plan the number of wells drilled will increase from 47,100 in 1978 to 55,800 in 1981, and increase of 18.5 percent, and investment in drilling wells will be 15.3 percent greater in 1990. Implicitly also, the effects of the plowback provision downgrades the connotation put on the price appreciation of productive assets by the Carter Administration:

In 1973-74, the oil-producing countries raised the world oil prices fourfold. Deregulation of oil and gas prices would make the U.S. producers the beneficiaries of those arbitrary price rises, and yield windfall profits from the increased value of oil and gas in existing fields. *The producers have no equitable claim to that enhanced value because it is unrelated to their activities or economic contributions.* (National Energy Plan, April, 1977, p. 50 (emphasis added)).

Of major importance in any program to maximize U.S. oil production is the lifting of controls in the price of domestically-produced crude oil. The President is initiating a program of phased decontrol by September 30, 1981. He is also urging Congressional action to *tax the oil company windfall profits which decontrol will bring in order to protect the public against unwarranted increases in oil company revenues.* ("Fact Sheet on the President's Program, p. 8 (emphasis added)).

Oil company profits are large in absolute dollar terms. However, profits as a percent of stockholders' equity in the oil industry were approximately 13.9 percent in 1978, compared to 15.1 percent for all manufacturing. (Newsweek, April 16, 1979, p. 27).

Decontrol of crude oil prices will raise federal, and some state revenues automatically with no increase in taxes. The normal corporate profits tax and severance tax would yield additional revenues from two sources: (1) the higher value of the same output of domestic oil and (2) the increased crude oil output anticipated from the higher prices. In fact, Carter Administration estimates place the increased corporate income taxes paid by oil producers at \$6.5 billion dollars (earmarked for the Energy Security Trust Fund) during 1980-82 as compared to \$5.0 billion collected by the windfall profits tax.

The duration of the excess profits tax mechanism must also be considered. The windfall gain of decontrol to oil producers is a short term phenomenon, the result of unanticipated changes in prices. Over the longer period, an efficient operating capital market will discount these "excess" profits in the price of the oil stocks, or in the dividends distributed to shareholders. A differential profits tax only on oil producers may actually retard the long-term ability of the industry to attract or retain external risk capital.

Other issues related to the windfall tax remain. First, other assets that experience increases in value due to unexpected shifts in market conditions are not subjected to this type of tax. Included here are stocks, inventories, and houses. Second, industries that suffer windfall losses as a result of the windfall tax are not to be compensated, according to the Administration proposal. Consistency of argument would require that such industries as the recreational vehicle industry be compensated for unexpected losses that will occur with decontrol. Third, over time as old and new oil is depleted, the windfall profits tax revenues will decrease. Consequently, a decision will have to be made regarding the future funding of the Energy Security Trust Fund.

#### *Uses of the energy security trust fund*

Public support for energy research and development is the major use of the Energy Security Trust Fund (ESTF), with 80 percent of the funds being allocated for this purpose. The President's policy is based on the maxim that "even if oil producers were allowed to retain all of the additional revenue from decontrol and succeeded in spending it on oil exploration and development, that would not be socially desirable (Schultze, p. 19)." The Nation requires several sources of energy supply, some of which might profitably be provided by private suppliers only after extensive research and development. The argument by the Administration has been that the funds required for R&D and the riskiness of the activity are too large to be borne by private interests. Consequently, the vast majority of the funds of ESTF have been earmarked for R&D for several sources of energy.

A second argument for this use of ESTF is that substantial externalities will exist when the new energy supply sources are operational. These include lowered levels of water and air pollution. These social benefits must be obtained through public participation in R. & D. efforts to generate the supplies in future years.

Provision of funds for mass transit essentially rest on the same arguments. However, the third use of the ESTF, assistance to low income persons and families, rests on a consideration of equity. It is alleged that poor persons should not suffer real income losses through higher energy prices. However, we are not able to distinguish this effect similar effects caused by unexpected changes in the prices of food, clothing, or other products. A superior remedy to the plight of the poor lies in the passage of a negative income tax, as has been proposed to the Congress and as has been supported by economists for some time. (See Mead, who argues that government intervention in energy markets to secure a "fair" price for consumers has been counterproductive.)

Several issues are raised by the proposal that the Federal government fund or otherwise participate in the R. & D. efforts. First, it has not been demonstrated that private concerns will not engage in this research, even if payback periods are long and the expected values of individual projects are low due to the high risk. Large businesses, such as the oil companies, with substantial cash flows, good credit standings, and considerable experience in energy development, might be able to finance these projects, since risk can be lowered through involvement in a large number of projects. Second, should private businesses not engage in this activity, the proper role of the Federal government might be one of insuring against losses rather than of providing the funds for the activity. For example, through the Federal Housing Authority the government insures home mortgages, but relies on private financial institutions to provide the funding for the mortgages. Third, should private financial institutions be unwilling to extend credit to finance these ventures, the Federal government might then establish a development bank and subscribe funds to it. The bank should be a quasi-independent agency, independent of the Department of Energy.

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 TESTIMONY OF WAYNE HARTKE, ATTORNEY

We take this opportunity to express our concern that an adequate supply of fuel should be assured our Nation's school buses.

The Carter administration is on record as supporting priority allotments to school buses. Under the standby rationing plan, school busing was defined as a part of "essential public service activity." In addition, there is strong and broad-based support in Congress for this categorization. Since no responsible opposition has been raised against the importance of school bus transportation, we hope that any action taken by this subcommittee will insure that school bus transportation receives the priority consideration it deserves.

The failure to provide adequate fuel for school buses would result in an increase in fuel usage. If the school buses do not take the students to school, parents will drive them. It is obvious that bus transportation is much more efficient than

individual cars. What is needed is a policy that recognizes the necessity and efficiency of school bus transportation. We hope your deliberations will result in such a policy.

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STATEMENT OF COMMITTEE ON FEDERAL FINANCE, COUNCIL OF STATE CHAMBERS OF COMMERCE

The Council of State Chambers of Commerce is a federation of 33 State and regional business associations. The Federal Finance Committee is one of several standing committees of the Council which develop and recommend policies on legislative issues to its member organizations and to the Congress. Normally, the policy proposals submitted to Congressional committees are first referred to the member organizations for endorsement, but in this instance that procedure was impractical because of the short lead-time available. Accordingly, this presentation is being made only on behalf of our Federal Finance Committee.

FOREIGN TAX CREDIT PROPOSALS OPPOSED

We have for many years held steadfastly to the position that so long as foreign source income is subject to U.S. tax, the foreign tax credit is absolutely essential if American business is to compete successfully in world markets. Likewise, we have consistently opposed proposals which would erode the foreign tax credit because the increased tax burdens caused by such erosion would make American business less competitive abroad. On each occasion that we expressed these views before your Committee over the years, we had the endorsement of a great majority, if not all, of the member organizations in the Council. Accordingly, we welcome this opportunity to comment on the Administration's proposed changes in the present limitation on the tax credit for foreign oil and gas extraction taxes.

We are opposed to the administration's proposal for several reasons—namely, its further erosion of the foreign tax credit, the purpose of which is to prevent double taxation of foreign source income; its effect of discouraging U.S. oil exploration and development in non-OPEC countries; its unfair provision for retroactivity; and its precedent for later application to U.S. multinational businesses generally.

During the last ten years or so the foreign tax credit has been under intermittent attack by proposals to limit or even repeal the credit. At the heart of the more radical proposals has been the fallacious belief that the tax credit is a tax incentive that favors foreign investment, and that such investment results in exporting of U.S. jobs and the importing of products which would otherwise be produced in the United States. The less radical proposals, by both legislation and regulation, have been made on the premise that some loopholes existed in the tax credit system and should be closed. Following the OPEC oil embargo in 1973, attacks on the foreign tax credit were directed to foreign oil and gas income rather than foreign income generally. Thus, in 1975 the option to use the per-country limitation in determining the credit was eliminated with respect to foreign oil and gas income. From 1960 to 1975 an election to use either the per-country or the overall limitation was available for all foreign source income. In the very next year, 1976, the per-country limitation was repealed for all foreign income.

Now the administration proposes a special limitation for foreign oil and gas extraction income. The credit would be the lesser of the credit computed on the overall basis and the credit computed on a country-by-country basis. If this provision should be enacted, will the next step be application of a similar provision to all foreign source income? It is certainly a prospect of serious concern to all U.S. companies operating abroad. It is especially serious in light of the fact that U.S. treatment of foreign operations and income of American firms is currently no more favorable than any of our principal competing countries treat their companies operating abroad. To the contrary, they generally treat their companies more favorably than does the United States. There can be no doubt that increasing the competitive disadvantage of American firms abroad would have adverse effects on our domestic jobs, on U.S. exports, and on the U.S. balance of payments.

In his appearance before the House Committee on Ways and Means on May 9, 1979, Secretary Blumenthal stated that the finding of more petroleum anywhere in the world is a benefit to the United States. We certainly concur. Unfortunately, however, the Administration's foreign tax credit proposal relating to oil and gas extraction income would discourage U.S. exploration for and development of oil reserves in countries which are not a part of the OPEC cartel. Given the serious



world shortage of oil that is not controlled as to supply and price by OPEC countries, a proposal that would discourage exploration and development elsewhere can hardly be deemed in the best interest of this country.

But that would be the effect of one of the changes the administration proposes in the foreign tax credit. Calling it a loophole, the Administration calls for repeal of a provision which permits deduction of exploration losses in currently non-producing countries from total oil-related income. It would require that such losses be deducted from extraction income in existing profitable producing countries. Under current law exploration and development losses in a profitable producing country are deductible only from extraction income in that country.

After the 1973-74 OPEC embargo, the Congress recognized the need to encourage U.S. exploration in non-OPEC countries and in 1975 it specifically provided for deductibility of exploration and development losses in non-producing countries from total oil-related income. As the Staff of the Joint Committee on Taxation noted in its recent report explaining foreign tax credit rules, "This special per-country extraction loss rule is designed to encourage the exploration for and development of new oil reserves in countries where the companies do not presently have significant production (countries which generally are not OPEC members)."

But despite the clear intent of Congress, the administration calls the provision a loophole and wants it repealed. The effect would be the equivalent of taxing these exploration losses and obviously discouraging such exploration. Moreover, the proposal seeks retroactively to tax such exploration losses incurred in the years 1975 through 1978. This would be accomplished by recapturing the tax benefits from losses in a country in those years to the extent of 50 percent of the extraction income arising in that country in 1979 and subsequent years.

To repeat, we have two main concerns about the Administration's proposal. One is the further erosion of the foreign tax credit and its adverse implications for U.S. multinationals generally, and the consequent adverse effects on U.S. jobs, exports, and balance of payments. Our other concern is this proposed punitive taxation of an absolutely essential, although currently unpopular, industry even though it would have the effect of discouraging the much needed discovery and development of additional world petroleum resources. To us, such action does not make sense.

#### NEW OIL SHOULD BE EXEMPT FROM WINDFALL TAX

Our committee has not met specifically to consider the President's crude oil windfall profits tax proposal or the provisions in H.R. 3919 as passed by the House. We have, however, discussed this legislation with some of our committee members and we feel confident that the one recommendation we make here would have the support of the committee and a substantial majority of the member organizations in the Council.

We preface our recommendation by first questioning the whole concept of a windfall profits tax on crude oil. Proponents of the tax argue that the removal of price controls on domestic oil and gradually allowing oil prices to rise toward world market levels will give oil producers an unfair windfall at the expense of consumers. They then assert that an additional heavy tax on the windfall portion beyond existing Federal, State, and local taxes—is appropriate and equitable. Their concept of equity with respect to the old oil is based on the ground that its cost of production is so far below the price to which it could rise under decontrol that an unreasonable profit would accrue to producers. For new oil, all above a predetermined price set by the Government would be considered a windfall subject to the additional tax.

The administration has recognized that oil should be priced at approximate replacement cost. That cost has risen rapidly during recent years, not only because of inflation but even more so because of the high cost of exploration for new reserves and of secondary and tertiary recovery of existing reserves. But insofar as the producers are concerned, the President's proposal and the House bill consider a price based on replacement cost as providing a windfall even though an extended period of price controls caused the windfall. In our view any additional tax on such a windfall is the equivalent of taxing capital, not profits.

If we must accept a windfall tax, we urge at least one significant change in the House bill. That is the exemption of all newly discovered oil from the windfall tax. Such an exemption would greatly encourage exploration and development and thus enhance the basic purpose of decontrol.

NATIONAL COUNCIL OF STATE PUBLIC WELFARE ADMINISTRATORS  
OF THE AMERICAN PUBLIC WELFARE ASSOCIATION,  
Washington, D.C., July 3, 1979.

Senator RUSSELL LONG,  
Chairman, Senate Finance Committee,  
2227 Dirksen Senate Office Building,  
Washington, D.C.

DEAR Mr. CHAIRMAN: I write on behalf of the National Council of State Public Welfare Administrators of the American Public Welfare Association. The Council, as you know, is comprised of the officials in each state and the territories responsible for administering the income maintenance, food stamp, social service, and medical programs that provide assistance to millions of needy persons.

Although we don't purpose to be experts in the area of energy, we are deeply concerned with the effects of energy and fuel inflation upon the already meager incomes of the poor. Low income individuals and families are bearing a disproportionate share of the hardship caused by escalating fuel costs. Aid to Families with Dependent Children, Supplementary Security Income, and Food Stamp benefits may not provide sufficient resources to keep pace with rising fuel costs and their impact on utilities, food, transportation, and other necessary goods and services. As a result, the Council adopted a resolution at its June 7, 1979 meeting urging that the revenues of the proposed windfall profits tax be used to assist the poor in meeting their basic energy needs. A copy of the resolution is enclosed for your information.

As always, members of the Council stand ready to assist you in fashioning an equitable system for easing the plight of the poor with the revenues of the proposed windfall profits tax.

Many thanks for your consideration. I ask that my letter and the enclosed resolution be included in the record.

Sincerely,

JOHN J. AFFLECK.

Enclosures.

ENERGY WINDFALL PROFITS TAX

Whereas the Administration proposes to tax windfall profits accruing to oil companies; and

Whereas poor people are seriously hurt by the rapidly inflating cost of energy and the anticipated rise in fuel costs as a result of proposed deregulation: Therefore be it

*Resolved*, That the Chairman of the National Council of State Public Welfare Administrators appoint an ad hoc committee to work with the Administration and the Congress to develop an effective way of using revenues from the energy windfall profits tax to provide energy assistance to low-income families and individuals.

Adopted by the Income Maintenance Committee June 6, 1979.

Adopted by the NCSPWA, June 7, 1979.

STATEMENT OF DR. V. STEPHEN KRAJCOVIC ILOK, CHAIRMAN AND PRESIDENT,  
ILOK POWDER CO., INC.

SUMMARY

1. Ilok Powder Company has perfected economically feasible and patented technology which reduces coal to ultrafine and submicron powders. This technology was pioneered by Dr. Hans Rohrbach in the 1940's and has been proven effective for over 20 years. The technology has the long sought substitute for oil not yet on stream, because our American technology, as the present energy crisis shows conclusively, is going lame.

2. The case in point are two spurious papers written for the sole purpose of fighting this superior coal powder technology from emerging as a new American technology. The Soo & Rieber paper is analyzed. This incompetent paper states that the Ilok/Rohrbach mill would not work since it would plug up the system and even if it worked it would require 205 Kwh/ton energy input. This is refuted since the two analysts failed to see the design of the mill which prevents any "plugging up" of the system and which also eliminates any kind of windage so that only 25 Kwh/ton energy input is required for the reduction of 1 ton of coal to 4 micron sizes and to also eliminate from coal all the ash and all the pyrites, including the organic sulfur.

3. The spurious Sohngen paper is also analyzed and the simplistic requirement of up to 256 Kwh/ton energy input, which would make the coal plastic and its reduction to 4 micron size impossible, is refuted.

4. Scientists of the DOE are criticized for using the two incompetent papers with the White House and with the Congress and for failing to inform the Government about the only authoritative and positive evaluation of the Ilok/Rohrbach mill by the Ohio State University, executed under a nondisclosure agreement with the Ilok Powder Company. This official University report confirms that 30 Kwh energy input is sufficient to reduce 1 ton (2200 lbs) of coal to 4 micron size and to remove at the same time all the impurities in coal, including "most of the organic sulfur".

5. The discovery of the "cell of coal" is discussed. Objections regarding its many uses that can promptly close America's energy gap, raised by the chief scientist of the DOE, are overcome. This means that America has the long sought substitute for oil, since 4 micron coal remains suspended in crude oil for 50 days and such mixture can readily be further processed in our existing oil refineries requiring only slight alterations. This also means that the 4 micron coal can be pyrolyzed without obtaining the unwanted char so that 1 ton of such coal will yield 4 barrels of "liquid coal" instead of 2 or 3 barrels as is the case under the present DOE coal liquefaction program.

6. The establishment of the Energy Security Fund as a result of the windfall tax from decontrolled oil is recommended along with the necessity for a realignment of scientists in the DOE with real knowledge not only in conventional coal but also in ultrafine and in submicron coal powders as only the latter ones can be effectively used for the solution of America's energy problem.

I. STATEMENT OF DR. V. STEPHEN KRAJCOVIC ILOK, CHAIRMAN AND PRESIDENT, ILOKPOWDER CO., INC.

My name is V. Stephen Krajcovic Ilok, Chairman and President of the Ilok Powder Company, Inc.

Again, it is with sentiments of appreciation that I have accepted this third invitation of the Chairman of the Subcommittee on Energy of the Committee on Finance, United States Senate to submit this testimony to help the subcommittee develop some of the background information that will be necessary when considering tax proposals related to energy production especially regarding the oil decontrol. A background information on energy that would be of some help to your subcommittee, has to be, Mr. Chairman, of such a nature that it will not only go into the causes of our present fuel crisis but must shed also light on how to avoid the more serious energy Pearl Harbour that will certainly come, if we do not act without any delay.

Senator Henry M. Jackson stated recently that "The American people are angry. They are angry at the gas dealers, they are angry at the President, they are angry at the Department of Energy, they are angry at Congress and they are angry at the oil companies."

Beside Senator Jackson everyone else is pointing an accusing finger for the current gas shortages, where the elusive culprit cannot be found. Therefore, I could not accuse the White House, the Congress or the DOE and not even the oil companies, but I would point my accusing finger at America's science and technology establishment, which since the time of the first Arab oil embargo in 1973 allowed precious five years to pass us by without finding a true substitute for oil and allowed America to become increasingly more dependent and vulnerable to imported oil.

America fell back in areas where it once led the world, and it is hard to fix attention on just the shortfall of fuels because the current atmosphere is overloaded with accusing fingers that point at each of us, with ecological fantasies, anti-nuclearism, with distrust of coal, and an obsession with difficulties rather than opportunities. Our technology, as the present energy crisis shows conclusively, is going lame.

The results of American technology gone lame and soft have created economic, political and social problems for in the absence of a substitute for oil we witness not only the beginning of a prolonged but permanent energy crisis with a long and painful period of difficult readjustment.

For the past 30 years America has led the world in developing new technologies. But today, when we need them most desperately, we don't see new technologies, new discoveries and new industries comparable in size to those built on the scale of Xerography, the computer, television, jet aircraft or space despite the unparalleled \$27 billion spent annually on research. What is even worse, when there is new tech-

nology, we refuse to see it and even fight it. The case in point is the Ilok coal powder technology, for which, Mr. Chairman, I already testified twice on two previous occasions before this subcommittee and which has the long sought substitute for oil that can help avoid America's second Pearl Harbour and can help avoid the long and painful period of difficult economical, political and social readjustment of American people to which I have referred to earlier.

## II. INCOMPETENT EVALUATION OF ILOK PROCESS IN THE SOO & RIEBER PAPER

What happened then and what prevented America from having its own substitute for oil on stream already to offset the present energy crisis, since my hearing before this Subcommittee on Energy on January 28, 1974, during which, Mr. Chairman, you have predicted that American industries would knock at the door of Ilok Powder Company?

American industries and investors knocked indeed, Mr. Chairman, even several foreign governments, but that did not last for long because certain special interests sensing rightly that even the 4 micron clean coal, if produced, would make coal gasification and coal liquefaction unnecessary, quickly organized so called "independent" but spurious "scientific" reports to stop Ilok coal powder technology from emerging as a valid American technology. Although this technology has been practiced for over 22 years successfully in Europe, American science and technology, already gone soft and lame by 1974, gladly lent its helping hand to special interests threatened by Ilok technology and disregarding the interests of American people two spurious reports were organized and paid for with the taxpayer's money. The net sense of these two papers was about the same as if today, post-fact, reports would be written to state that "America could not put a man on the moon, and even if it would put a man on the moon, it would not serve any purpose."

"The Final Report & Evaluation of the Ilok 4 Micron Coal Grinding Process, Illinois University at Urbana-Champaign, Prepared for Federal Energy Administration, Washington, D.C., Office of Energy Resource Development, December 1976 has just such a meaning."

And, although the title page suggests that this paper was written officially by the University of Illinois, one of the inside pages carries the statement that it was done independently of the University of Illinois by Professor Shao Lee Soo and Professor Michael Rieber. Hence this is not an official University of Illinois report. A letter dated February 11, 1976 written by the Vice Chancellor of the University, George A. Russell, assures explicitly: "Please be advised the University of Illinois has no contract with the Federal Energy Agency involving use of information supplied by Ilok Powder Company, Inc." Nevertheless, the DOE, successor to FEA, refers to it inaccurately in its contacts with the Congress or the White House as the "University of Illinois Report", which it is not. There is only a Soo & Rieber paper, a paper of two individuals, one specializing mostly in electrical precipitators and the other in economics and computers, hence neither one as expert on rotary engines such as the Ilok/Rohrbach grinder, nor expert on comminution of coal to ultrafine and to submicron sizes and neither of them with the expertise in the important field of rheology. To say the least, neither one of the two individuals is an expert on coal. But to use for this paper the name of the "University of Illinois at Urbana-Champaign Final Report & Evaluation of the 4 Micron Coal Grinding Process" by the U.S. Department of Commerce and by DOE, the successor agency of FEA, is not only fraudulent in their communication with the government and with the public, but is directly responsible for the present unpreparedness of the United States to successfully cope with gas shortages and the energy question. How? Let us see what the real "Soo & Rieber paper" has to say.

## III. CURSORY ANALYSIS OF THE SOO & RIEBER PAPER

### 1. *"The design simply is not going to work"*.

The two analysts did not even see the design simply, because they did not ask for it, yet they say that it would not work, although it worked for 22 years! How then, could they have made the above statement? Dr. E. O. Banje, Consultant, Turbo Machinery, Hollywood, California stated to Batelle Institute "All available comminution theories are based on simplified assumptions and that they cannot be necessarily invoked as an absolute counterproof of Ilok values. Therefore in agreement with several comminution specialists, it is possible that a breakthrough in grinder design has been obtained." And to the Library of Congress, Dr. Banje stated that "a much higher efficiency may be expected at low pressure operation (of the Ilok grinder) than is obtainable with ball mills or fluid energy

devices. Also, the often cited Rittinger Law, that predicts 380 KWH KWH/ton for 4 micron particles, cannot necessarily be invoked as counterproof because the technology in question assumes very simplified conditions. Also since the design of the mill is quite different from other impact mills, **NO SOLID ARGUMENT THAT CAN DISPROVE ITS CLAIMED PERFORMANCE COULD BE FOUND.**"

But the two analysts from Urbana did not want to see it that way since they were not the experts on rotary engines and had chosen to doubt in advance the energy input of 25 KWH/ton energy input needed for the reduction of coal to 4 micron size, not even asking for and not even studying the master design of the Ilok/Rohrbach mill.

2. "The only coal reportedly tested in an Ilok Grinder was brown coal".

This statement is entirely false. Even in the MTZ magazine piece written by Dr. Rohrbach himself in 1971 shows the micrograph of a section of the 4 micron powder anthracite coal. Furthermore, Dr. Rohrbach stated in the same article that besides coal, many vegetable products have been used in the same comminution process such as coffee, soy-beans, rice and rice hulls and other vegetable residues, which, when reduced to 4 micron size yield up to 7,000 to 8,000 BTU per pound, on which basis the United States can become energy self sufficient in no time by expanding its own agricultural production especially on the idle arable land. In this context, to further refute the above false statement of the Illinois analysts, it must be stated that near Leipzig, Saxony, Dr. Rohrbach used brown coal and in Switzerland the imported bituminous coal. This means that coal of all kinds and vegetable products of many types were successfully used in the Ilok/Rohrbach grinders.

3. "It appears that any higher rank coal would require more grinding energy".

This is false again. The original grinder in Bochum used anthracite requiring 25 KWH energy input per ton of coal. When subsequently brown coal, peat, bituminous coal and vegetable products were processed in this same grinder the energy input never changed. What changed was the temperature that evolved due to the grinding process. Thus, when anthracite was comminuted, 120 degrees C temperature evolved, but when brown coal was processed only 110 degrees C temperature resulted and when vegetable products were processed only 105 degrees C temperature was obtained. And if 205 KWH advocated by the analysts would be applied, then surely the whole system would plug up, simply because the temperature evolved from 205 KWH would make the coal plastic, hence ungrindable.

4. "Regardless of the above, we do not believe that the equipment will work because, in part, it will plug up by its own centrifugal force".

It would not "plug up" by its own centrifugal force, but by the high temperature evolved as a result of 205 KWH, which would make the coal plastic. This shows that this is the most reckless and irresponsible statement of the two professors. Sure, it would plug up the system, if they would not know, and they did not know how to unplug such a system simply because they did not even care to ask for the master design of the grinder, which I had with me. The master design would have revealed to them those principles, which are used for the overcoming of the "plugging" and for the overcoming of forces that cause air friction and windage in general, speaking aerodynamically, so that at the end the whole grinding of 1 ton of coal cost only 25 KWH of energy input.

5. "The design simply will not work. Furthermore, even if it did work, the energy requirement would be far in excess of 25 KWH/ton even if the mill turned with coal being ground.

Yes, as Dr. E. O. Banje stated to the Library of Congress, one could predict an energy input of up to 380 KWH/ton, using the principles of non experts on rotary engines. The analysts of Urbana ignored completely any counterproof against their obsolete theories, as stated under item No. 1, which do not take into account the breakthrough in the design incorporated into that grinder by Dr. Rohrbach. He was the greatest engine designer of Germany, so great indeed that when a delegation of German energy experts that toured America in 1976 arrived at the University of Nebraska and was asked about the 4 micron coal particles, Dr. Ing. Hans Linneborn, who knew Rohrbach personally, exclaimed to the Chairman of the Agricultural Department of the University as follows: Since you Americans now have the Rohrbach design, you have solved the energy problem". Whereupon the delegation called Ilok Powder Company immediately, came to Washington, and made a written offer to build these same Rohrbach grinders in Cologne, Germany, for export to the United States. Only because I am an

American, I resisted this attractive offer as I did not wish to change America's dependence on foreign imports of oil for a second dependence of energy on foreign-made machinery.

6. "There is no reason to believe that even if the grinder worked properly, that it would remove impurities as stated".

At this point, when trying to make Ilok's removal of impurities from coal an impossible one, the two professors made such a hasty job, that they even forgot to check on the accurate values pertaining to ash and pyrites that the Ilok technology claims to remove from coal. The professors, not being experts on coal, claim that the specific weight of ash is 2.6 and that the specific weight of the pyrites is 2.8. They also claim inaccurately that some of the ash and of the pyrites will be reduced to 3 micron size, and even to the 2 micron size, hence based on these false values they erroneously concluded that these impurities cannot be removed from coal. But the professors were wrong again. The specific weight for ash is 2.6, but the specific weight for the pyrites is 5.0. That, from the technological standpoint, is crucial. As to Ilok mill's grinding of such substances to 2 or 3 micron size, that is a sheer impossibility, because of the discovery arrived at in the course of the comminution work of the Ilok Powder Company, which is: **MECHANICALLY ALL SUBSTANCES IN THE ILOK REDUCTOR MILL CAN ONLY BE REDUCED TO 4 MICRON SIZE.** This means that coal is reduced to 4 micron size, but also ash and pyrites are only reduced to this same 4 micron size. Consequently, the following formula for their removal applies:

**RATE OF ACCELERATION AND TYPE OF EXIT FROM THE MILL FOR PARTICLES OF DIFFERENT SPECIFIC WEIGHTS**

Type of particles	Specific weight	Rate of acceleration: $\frac{\text{Size}}{\text{specific weight}} \times$	Exit from the mill
Lignite.....	0.7	$4u^2 \times 0.7 = 11.2$ .....	Axial.
Anthracite.....	1.3	$4u^2 \times 1.3 = 20.8$ .....	Do.
Ash.....	2.6	$4u^2 \times 2.6 = 41.6$ .....	Radial.
Pyrites.....	5.0	$4u^2 \times 5.0 = 80.0$ .....	Do.

The above table provides the evidence of the speciousness of the two analysts and defeats them on their own ground. Besides, a Paper "Advanced Technology: Alternatives to Stack-Gas Scrubbing, presented at the American Institute of Chemical Engineers, 1976", by Dr. James M. Evans, states: "Having seen American equipment based on similar principles operate with surprisingly fine results, I have no difficulty in accepting the Rohrbach reductor-ejector combination". And the Library of Congress, in this regard states: "If indeed all inorganic ash and sulfur particles can be removed, clean fuel produced by the Rohrbach mill **COULD ELIMINATE THE NEED FOR MANY COAL LIQUEFACTION AND GASIFICATION PLANTS AND OF DESULFURIZATION DEVICES.**" (Hearings, Committee on Science and Technology, U.S. House of Representatives, 94th Congress, July 29, 30, 31, 1975). Could this have been the reason for the two analysts to have applied wrong specific weight for ash and pyrites? I shall comment on the removal of organic sulfur from coal, however, in connection with the fossil cell.

7. "While it (4 u coal) can be used in boilers, ordinary coal also works well".

Professors Soo & Riobe: are against any technical progress in coal science. They advocate the use of ordinary coal which pollutes, in lieu of the clean 4 u coal which does not pollute. If that were so as the analysts argue, American utilities would be required to spend at least \$60 billion for the conversion of the old oil and gas-burning boilers to coal-burning boilers. They also would have to spend additionally \$9 billion for the use of scrubbers and another amount of \$10 billion for the disposal of ash-slag. All this cost is, however, saved when the 4 u clean coal is used instead, because in their analysis the two investigators from Urbana failed to mention one absolutely crucial point about the 4 micron coal: *It burns without any residue*, hence it can be used equally well in the old oil and gas burning boilers as it can be used in the coal burning boilers. (See Rohrbach, MTZ, October 1971, pp. 380-381 "Untersuchungen der Verbrennung und der Staube".)

8. "4 micron coal will be colloidal in residual oil #6 but 230 mesh (62 um) has also shown to be satisfactory".

Again, the analysts are against any technological progress. For them the dirty 230 mesh coal is equally satisfactory as is the clean 4 u coal, from which all the impurities have been removed, including organic sulfur. Only men serving special interests use such arguments as used by the analysts.

9. "As a colloid with crude oil, the mixture would work but refinery process would have to be altered, at least to allow the use of significantly more H<sub>2</sub>O." And the analysts also confirmed that "4u coal would remain suspended in crude oil for 50.8 days, while in No 6. oil it would remain suspended for 16.9 days."

Both Professors, Soo and Rieber finally admitted the most important use of the 4 u clean coal powders. But this is exactly what Ilok Powder Company is advocating, because on this one basis America can become energy self sufficient overnight, since our coal reserves will last for at least 500 years.

Since Ilok technology by steam reforming of the 4 micron coal produces between 80,000 to 100,000 scf of hydrogen from 1 ton of coal (depending on the type of coal used), the above is not only viable but is a must for America and for all of the industrialized nations of the world. From the economical point of view such a project as this would tend to lower prices of oil and of the resulting gasoline, since coal is still cheaper than oil. By blending oil with coal and by refining such a mixture, lower prices of gasoline would most definitely be obtained.

10. "It would be useful for mixing with No. 6 oil, if the material could be produced at the same cost as 62 u coal."

Again, the two analysts made another significant concession which will contribute, if carried out, to America's lesser dependence on the imported oil. Naturally, the production of 4 u coal costs less than the 62 u coal, as the experience for over 22 years convincingly demonstrated, since the cost of grinding 1 long ton to 4 u size is only 30 KWH according to an official Evaluation of the Ilok/Rohrbach grinder by a prestigious American University, as shall be mentioned here later. The University based its conclusion on the "master design" and other performance data and drawings, which the two analysts from Urbana did not even care to ask for.

11. "The plant could be built in one to two years, but we see no reason to do so".

Even after the analysts conceded finally that the 4 u coal could be blended with crude oil for refining and that it also could be mixed with the No. 6 oil, it is most puzzling to see why they could not find a reason to build such plants in order to alleviate our national energy crunch which President Carter calls a "Chronic problem" from now on and for which already on this basis America could find a lasting solution.

12. "We feel that a more productive future is to be found in coal gasification and there is no way that the Ilok process can currently or in the foreseeable future contribute to increased SNG, and it will have no beneficial effects on electric utilities".

After they admitted that 4 u coal can be blended with crude oil and also with No. 6 oil, the analysts contradict themselves saying that Ilok process will not have beneficial effects on electric utilities. They also show again their profound ignorance of coal science saying that the Ilok process could not contribute to increased SNG by not telling the readers of their "paper" that 4 u coal powders burn as gas, i.e., without any residue, hence it could eventually, as the Library of Congress stated to the Committee on Science and Technology, "eliminate the need for many liquefaction and gasification plants" provided Ilok would produce its 4 u coal "clean". And that, Ilok can do, as already partially discussed earlier regarding the removal of ash and pyrites, and as shall still additionally be discussed when the question of the removal of organic sulfur comes up in the course of this discussion.

#### IV. THE SOEHNGEN PAPER

After the two professors from Urbana disposed with the Ilok process in their very specious and unprofessional manner, they then hoped to give that process final "coup de grace" by combining the scientific errors of their own paper with the collection of hearsay and gossip assembled and published in another detrimental and incompetent paper, "Analysis of Ilok Coal Cleaning Technology", prepared by Erick Soehngen, but financed and distributed by EPRI, in order to help prolong the dark ages of the airpolluting 200 mesh coal, on which all our present and inadequate coal liquefaction and coal gasification processes are based, that now see a threat in the inevitable advent of the age of clean 4 micron coal and its related technologies. Whether the combination of these two incompetent but detrimental papers are a part of a plot to also prolong America's dependence on foreign oil is difficult to answer at this time. There is, however, no doubt that both papers were centrally orchestrated so that our long gas lines and the prospect of heating oil shortages next winter, quite ironically, passed up an easy way to solve the energy problem with the Ilok process.

Similar to the Soo & Rieber paper, the Soehngen paper was undertaken without any access to the "master design of the 4 u coal grinder", and without any access to the engineering data, specifications, drawings and performance information regarding the mill. And, since Eric Soehngen is neither an expert on rotary engines nor on aerodynamics, and not at all on comminution of coal and not even on coal in a general sense, EPRI has chosen him for the ungrateful task of gathering of any and all detrimental background information regarding the Ilok coal cleaning technology. Nevertheless, some of his allegations must be answered.

(1) "No facts were found to corroborate the claims of Ilok Powder Co., Inc. of the past or present existence of the Rohrbach developed high-performance comminution mill or of a German (or Rohrbach) developed clean coal technology", states the Soehngen paper.

The past Rohrbach mill in West Germany was destroyed by the British Airforce in 1943. Mills built in Eastern Germany were dismantled in 1949 by Dr. Rohrbach. And those in Switzerland were under the control of the Military Authorities, who would not engage in any talks with Eric Soehngen.

(2) "Coal dust diesel engines were never fully developed and were not used commercially", states the Soehngen executive summary.

Quite rightly so. The coal-powder diesel was not fully developed in the Hanover-Bochum area, because the Nazi Government transferred the now classified project to another area in order to start developing the submicron powders from coal in the size of 1:300 micron for military use. Obviously, this was a secret project, of which few, if any, persons knew anything. But, since the powders in the size of 1:300 u size were produced, which incidently cannot be obtained without a simultaneous removal of all the impurities from coal, including organic sulfur, the above statement in the Soehngen paper is most inaccurate and from a purely technological point of view prejudiced with intent to mislead American people.

(3) "The comminution mill patent for which Rohrbach applied in 1943 was not executed", informs the Soehngen paper.

There was no time for its subsequent execution, because Berlin soon was occupied by the Soviet and Allied Armies and the German Administration was disbanded. The comminution mill patent was, however, obtained in a foreign country.

(4) "The specific opinion expressed by the following (names of so called comminution experts) are all reportedly consistent with the Soo/Rieber analysis", state the two analysts from Urbana, by listing the names of those used in the Soehngen paper.

Specific opinions allegedly expressed by a "number of comminution experts" has no value, since neither one of them ever produced 4 micron coal or submicron powders in the size of 1:300 micron. If they would have produced such powders, both Europe and America would already have their own substitute for oil by now. The German offer made to Ilok Powder Company for the production of Ilok 4 micron coal powders and equipment in West Germany by Dr. Ing. Hans Linneborn in 1976 speaks for itself, and defeats the contention of all three incompetent analysts; Professor Soo, Professor Rieber and Mr. Soehngen.

(5) "None of the government agencies . . . was given information that would have enabled them to assess this technology".

This is a correct statement, since the government agencies were not willing to sign a non-disclosure agreement with Ilok Powder Company, Inc. But all of these above statements are irrelevant ones in comparison with the following statement, which was to give the Ilok process a deadly blow, even if a manifest lie is used to inflict such a harm.

(6) "Contrary to the statements made by the Ilok Company, Rohrbach . . . gives the energy absorption of the mill as 257 KWH/T rather than 25.58 KWH/T claimed by the Ilok Company", states the Soehngen paper, and restates the Soo & Rieber paper with a joy of vindication for its own miscalculation of previously reported 205 KWH/T due to enormous "air friction" in the mill, which the two analysts from Urbana did not know how to eliminate.

The MTZ article by Dr. Rohrbach of 1971 gives insight into the gradual development of the first mill. A careful study of Dr. Rohrbach's early work in Bochum, where he actually built his first One-ton-hour 4 u reductor mill, shows that the first mill was used to feed a one cylinder coal-powder-diesel of only 135 HP. Such small coal-powder-diesel engine naturally could not require the 1 ton/hour 4 micron coal powders, which the new mill was capable of producing each hour. Since these were the very beginnings of the coal powder technology in ultrafine sizes, the know-how to handle and to store such 4 u coal powders was not yet



available. For this reason only the hourly amount of 100 kg of 4 micron coal powders has been produced. This certainly took the entire energy input of 33 HP since the electro-motor serving the mill had the performance capacity of exactly 33 HP and that, as those skilled in the art know, could not be altered.

The use of the full performance capacity of the mill came later, when Dr. Rohrbach converted larger diesels for the use of 4 u coal and when he learned how to handle the 4 micron coal powders, how to transport them and how to store them for later uses so that then one ton of 4 u coal powders were produced. Hence the energy input value of 33 HP/T was always the valid cost for the production of 4 u coal powders irrespective of whether 100 kg, 200 kg, 500 kg or 1000 kg of 4 micron coal powders were produced in that mill each hour. Dr. Rohrbach confirmed this in writing in his own words as follows:

"Also eben 97.3% der aufgegebenen Menge von 50, 100, 500 an bis 1000 kg die Feinheit von 4 u Aufweist, und das kostet immer nur 33 PS.

This does not require any comments and this defeats the purposes for which both the Soo & Rieber paper and the Soehngen paper were written and financed for taxpayer's money.

The correctness of the above Rohrbach statement was confirmed in an official evaluation of the grinder by a prestigious American university, as shall be reported later. It also has been discussed in great detail by Dr. Rohrbach with two Pentagon experts in Munich in 1964. The discussion was taped and the tapes which exist confirm again that the reductor mill always used only 33 HP energy input to reduce 1 ton of coal to 4 micron size within 60 minutes.

#### V. THE FOSSIL CELL OF COAL

The description of the "fossil cell" in the Soo-Rieber analysis shows that the investigators knew nothing whatsoever on that subject. Indeed there are few experts on that subject. Edwin R. Phelps, President of Peabody Coal Company, Business Week, July 11, 1977 clearly stated: "We don't see anyone there with any real coal knowledge", and no lesser authority on that subject than Dr. Robert D. Thorne, Assistant Secretary for Energy Technology of the DOE in a speech delivered in Pittsburgh on August 2, 1978 stated: "After all these years we still don't really understand the molecular structure of coal." Unless we know, we as a nation cannot make any real progress towards making America less dependent on foreign supplies of energy.

No wonder that the Illinois analysts wrongly stated as follows:

(1) "The fossil cell does not really exist, following coalification."

William A. Bone and Godfrey W. Himus, in "Coal, its Constitution and Uses", 1936, p. 75 states: "The systematic examination of coals under microscope . . . has shown that all coals, whatever their degree of maturity, contain abundant and recognizable plant structures more or less preserved, ranging from perfect and delicate cell structures . . . to finely comminuted matter . . ."

(2) "Coalification involves the gelification of the cells . . . the cells become virtually unrecognizable".

Objection that in many coals that once existed in gell-like form and that their "cell structure" is not detectable on micro-petrographic investigation, has been refuted in the studies on optical anisotropy of exactly such coals by Dr. E. Hoffmann and Dr. A. Jenkner, Gluckauf, no. 4, January 23, 1932, pp. 81-88. They confirm that even this type of coal is "cell structural" as I had claimed. This means that my finding regarding the existence of the "fossil cell" or the "cell of coal" is a valid one, and that therefore all coals are indeed "cell structured", not just those which show spores, megaspores and cuticles, but even coals consisting mainly of unrecognizable attritus (coalified plant debris) or an anthraxylon (coalified woody tissue of plants), which at one time were cells in the above sense.

(3) "Plant cell sizes average from 10 um to 100 um or approximately 15-25 um across and 50-100 um long. This is significantly higher than the Ilok 4 um size".

The analysts omitted to mention that the yolk of an ostrich egg is 70 mm in diameter! That also is a cell. If their above statement were correct, there would hardly exist any need for grinding coal below its 100 micron size, since even such large coal cells would burn without residue and on that basis alone America would already have its long sought energy self sufficiency. This shows again that the Illinois analysts are very wrong. They speak of "plant cells"; I speak of "fossil cells".

The facts are these: The original or primordial plant cell upon its coalification is very small. What is preserved is its skeleton or structure, which shows all the basic component parts of the original cell. It features the outlines of mitochondria,

endoplasmic reticulum, vacuoles, Golgi canals, cytoplasm, ribosomes, pores and above all the well preserved inner membrane of the cell, which membrane cannot be mechanically removed. Based on this discovery, mechanically coal cannot be reduced to smaller sizes than such, which preserves this inner membrane. For this reason also such inner membranes have been successfully removed only with other than mechanical means as described by Fritz Zetzche and Oskar Kalin in their article "Eine Methode zur Isolierung des Polymerbitumens aus Kohlen, Braunkohle, 1932, pages 345-366.

Since the membranes of the cells cannot be destroyed mechanically it shows the complete fallacy of the above size of coalified cells as indicated by Professors Soo and Rieber as all the grinders which at the present time are mechanically reducing coal to even 74 micron size would fail to perform their task due to the impossibility to remove inner membranes mechanically with very dire consequences for our electrical utilities. So, then, how large is the "fossil cell" or the "cell of coal"? The answer to this question is indicated in many works—too long to cite here—of the Kaiser Wilhelm Institute fuer Kohlenforschung in the thirties in discovering a sudden increase in the extractibility of soluble bitumen in sizes of coal below 10 micron and in proving that "this sudden increase in the yield of bitumen is not proportional to the increase in the surface area of such micronized coal but is due to at least a partial destruction of the membrane of the "cell of coal substance". Such a destruction of the membrane, partial or total, was responsible for the increased yield of bitumen. This work convincingly proved that the size of the "cell of coal substance" was somewhere below the 10 micron size. But no one knew the cell's exact size.

The discovery of that knowledge was reserved to the work of Dr. Hans Rohrbach who by attempting to burn coal in a diesel engine found that not only the 10 micron coal sizes but even 7 u and 6 u and 5 u sizes did not burn completely in Diesel, since they all left behind char, which still contains small amounts of the "wall of the cell not yet removed from the final cell of coal". He also found that only coal particles in the size of 4 micron burnt completely without leaving behind any char whatsoever. Thus and in this manner the size of the "cell of coal substance" was established in the year 1936 and subsequently published in MTZ, October issue, 1971.

(4) "Dr. Rohrbach's mill explicitly used brown coal" state the analysts.

This is a wholly incorrect statement, as explained earlier.

(5) Professors Soo and Rieber, in their discussion of the Ilok cell of coal failed to mention the significance of this discovery for the economy of energy of the United States.

It is as follows: the preserved skeleton of the "coal cell", when thinly sliced on the microtome in sections, shows not only the basic elements of the cell such as mitochondria, vacuoles, lysosomes, endoplasmic reticulum, cytoplasm, Golgi canals, chloroplast and the inner membrane, but when further investigated with a spectrometer reveals that wherever in the original cell energy was generated, we now see gas. That's the case with mitochondria and chloroplast. But wherever energy was either transported or stored we now see bodies of bitumen (which is tar, petroleum and naphtha as defined by Webster's Collegiate Dictionary) particularly in endoplasmic reticulum and above all in the Golgi canals. Elsewhere in the fossilized cell are seen resins and also organic sulfur, empty spaces and molecules of the substances such as paraffin. Identification of the above substances with the spectrometer and by a correspondingly strong illumination gave us the spectral colors typical for each individual substance contained in the cell. This identification took place as late as 1964 in Munich, Germany during my visit and work with Dr. Rohrbach. But the Illinois analysts not being experts in this field of coal science never raised a single question about this most crucial aspect of my discovery, which indeed presents the total solution to the energy problem America faces.

Why?

(A) The cell of coal with its enormous surface area and having a much larger percentage of its atoms at the surface as opposed to atoms that are still buried within the mass of larger particles, such as the now used 74 micron coal powders, can be expected to possess energy in excess of that obtained with the bulk of coal. On that basis alone, and not on my previously held view of the second law of thermodynamics—with a smaller quantity of the 4 micron coal we can obtain the same performance which up to now we have been obtaining with a greater quantity of conventional coal in an industrial boiler. (Compare: Industrial Research, August 1965, p. 66, by Dr. P. J. Clough and Dr. J. C. Hansen.) It follows that the old oil and gas burning plants will not need to spend up to \$60 billion for their conversion to coal burning boilers, since the "cell of coal" burns without a residue. (See MTZ, October, 1971, Rohrbach, p. 380 and 381.)

(B) The cell of coal has most of its atoms on its surface. By pyrolyzing it only liquid and gaseous hydrocarbons result without any char. In this manner and in only one single additional step the first form of America's substitute for oil and gas is obtained.

(C) The cell of coal, when steam reformed, yields 97 percent of hydrogen exactly as when natural gas, propane or any liquid hydrocarbons are steam reformed. Thus the physical and institutional framework and foundation for the most likely long term energy economy based on hydrogen are created. If therefore there are objections against burning coal, such should be converted into  $H_2$  because it burns even without evolving the objectional  $CO_2$ .

(D) A combination of the results from the processes B and C allow America to tailor any fuel it may require.

(E) By thermally decomposing the "cell of coal" we recover carbon and hydrogen as a by-product. All carbon, not just a part contained in the original coal is recovered. This is again not identical with the "puffed wheat" referred to by Illinois University experts on electrical precipitators and on computers, but identical with the results of thermal decomposition of natural gas or oil, which also yield only carbon and hydrogen.

Since most of these applications were practiced and since the equipment for their utilization exists, this discovery of the Ilok "cell of coal" has a universal validity, applicability and predictability. The White House was therefore notified about it in January, 1979.

(6) How does the discovery of the "cell of coal" tie in with the removal of the organic sulfur from coal?

Contrary to the statement of the analysts from Urbana that organic sulfur would not be released even if coal is reduced to 4 micron or 1:300 micron size particles, this is the easiest problem facing American utilities. I stated earlier that the "cell of coal" has an enormous surface area, which has a large percentage of its atoms, including the atoms of organic sulfur, at the surface as opposed to atoms that are still buried within the mass of larger sized coal particles, such as the presently used 74 micron coal particles. (Industrial Research, August, 1965, p. 66.) By reducing coal to the "cell of coal" size, the wall of that cell has been successfully removed. What was left over, however, is the inner membrane of that cell. Though this inner membrane cannot be crushed or destroyed mechanically for purposes of liberating the atoms of organic sulfur, it is most reactive to thermal and various chemical means. By properly applying Ilok's thermal method to the "cell of coal", atoms of the organic sulfur are the first among the substances of the "cell of coal" that immediately leave the cell and are recovered for the marketing of such sulfur. This means that an absolutely clean coal is obtained, since in addition to Ilok's removal of ash and pyrites as pointed out earlier, the organic sulfur is now removed and recovered.

The dramatic results of this new and novel cleaning method of coal mean that "the biggest single investment ever made in disease prevention totalling up to \$100 billion by the end of the century as America's bill for cleaning coal of sulfur" (London Economist, January 6, 1979, p. 63) can now be avoided.

Naturally the analysts from Urbana are excused for their lack of expertise regarding the substance of coal. Even the National Research Council of the National Academy of Sciences in its News Report, Volume XXIX, Number 6, June 1979 states precisely this: "In relation to the value of coal as a source of energy, current scientific and technical information about coal is pitifully small." Then it continues: "A key problem is the chemical and physical complexity of coal. Necessary research includes extensive study of properties of coal and of coal products, such as cokes, chars, and coal liquids . . . etc." states the Council in its report submitted to DOE. This is a very constructive criticism in addition to that already mentioned by the Assistant Secretary of DOE for Technology and by the President of Peabody Coal Company, both of whom stated that there are no experts on coal neither in the DOE nor outside of the DOE. It would therefore be futile to expect that knowledge on coal in the two analysts from Urbana, whose field of expertise is not coal at all.

#### VI. CONNECTION WITH DOE

Since DOE uses them, the two spurious papers mentioned here were most probably orchestrated by the very Government Agency whose task it is to provide the American people with a comprehensive energy policy, particularly with the development of a genuine substitute for oil. In this task the DOE not only failed, but lent its support to all such steps that have obstructed the development of just such a substitute for oil.

Let me explain. Present Acting Program Director for Fossil Energy of the DOE, George Fumich, Jr., already in 1961 was instrumental in awarding a contract No. 14-01-001-226 to Bituminous Coal Research, Inc. for purposes of producing ultrafine coal powders, because it was felt that such ultrafine coal powder plants could be built across the nation to product 10,000 tons of such powders daily in each of the plants to generate electricity. Allis Chalmers, Combustion Engineering Company and "coal experts" from the Bureau of Mines and the Office of Coal Research cooperated in the project. But the combined effort failed, producing only 39 pounds of ultrafine powders from 1 ton of coal, and even at that only ultrafine powders of various, not uniform sizes. Since the Ilok project was based on the European experience, it suffered of the "NIH Factor", ("not invented here"), and the Ilok proposal was judged inadequate automatically. How could it be possible to reduce all the 97.3 percent from each one ton of coal to uniform 4 u sizes, when the American experience produced mere 39 pounds of ultrafine powders? It was judged that Ilok was wrong and had to be stopped.

Thus it happened that the "coal experts" of the DOE, mostly officials already associated with the OCR or Bureau of Mines taken over by DOE, not only supplied the authors of the two spurious Soo & Rieber paper and Soehngen paper with encouragement but also provided them with certain damaging information from OCR (through Gilbert Associates) indicated on page III-5 of the Soo & Rieber paper that was protected by contracts of Gilbert with Ilok Powder Co., Inc. The same officials of the DOE, who since 1961 advised to no avail the Kennedy, Johnson, Nixon, Ford and now the Carter Administration on coal, advised each of these administrations negatively on the Ilok Coal Powder Technology apparently due to the "NIH" factor, and later on the basis of the incompetent Soo & Rieber and also of the equally incompetent Soehngen papers. Finally the same "experts on coal" went so far as to state through Dr. David O. Webb, to the Boston Herald American on April 20, 1977 that "Ilok is patiently working on a \$10 million scam of the U.S. Government, using the energy crisis as a tool." And as recently as March 30, 1979 after I wrote the President about the discovery of the "cell of coal" and about the outlook of closing the energy gap, no lesser authority than the Director of Energy Research, John Deutch, hence the top scientist of the DOE sent to the White House the two spurious papers trying to prove Ilok technology wrong and made scientific assertions, which are completely invalid, when he wrote:

(1) "The organic part of coal is not composed of various hydrocarbons but is composed of large-ringed structured molecules, containing principally carbon and hydrogen atoms, but also heteroatoms such as oxygen, nitrogen and sulfur."

I cannot accept the above statement. How does the Director of Energy Research of the DOE explain the section of the 4 micron coal seen in the micrograph (MTZ, October 1971, page 384) with a 6250 magnification and the statement by Dr. Hans Rohrbach saying that the contents are: tar, sulfur, resin, mineral oil, paraffin, air, water and other substances? Are some of these not hydrocarbons? And what is the meaning of the article "Coking Properties of Coals", by F. Fischer, H. Broche and J. Strauch, in Fuel—Volume 5, No. 10, pp. 466-475 (1926) showing that coal contains "bitumen" which is composed of soluble oleaginous portion and an insoluble brown solid powdery portion, while in their earlier work in Brennstoff-Chemie, Nr. 3, Bd. 6, pp. 33-48, 1925, these coal experts clearly state that bitumen in coal is composed of hydrocarbons and that oil bitumen in Dilsburg coal has 9.91% H<sub>2</sub> and 89.33% C, but the solid bitumen in the same type of coal has only 6.47% H<sub>2</sub> and 86.99% C? On this basis, therefore, and quite contrary to the definition of coal used by the chief scientist of DOE, coal is a hydrocarbon mineral and to state this even more precisely, coal's original organic material thru titanic pressures is transformed into a concentrated carbon-hydrocarbon form.

The President and the Congress deserve to be better informed.

(2) On pyrolysis he again misinforms the President by saying that "Pyrolysis of any coal (independent of particle size) produces char, gases and liquids."

This is scientifically invalid. When we come to 20 micron size of coal, we see a sudden change in coal's behaviour: gradually less and less char (or coke) is produced, and by 4 u size, no char whatsoever is obtained, only gaseous and liquid products remain. (See my Senate Testimony, Joint Hearing before the Subcommittee on Energy & the Subcommittee on Financial Markets of the U.S. Senate Committee on Finance, May 7 & 8, 1975, page 122 and see again: MTZ, October 1971, pp. 380-381: "Untersuchungen der Verbrennung und der Staube").

(3) On hydrogen, the Director informs the White House that the steam reforming is a chemical reaction and that "the chemistry of this reaction will be independent of the size of the coal particles".

But he is again entirely wrong, because at the 20 u size of coal, at which a gradual removal of the "wall of the cell" begins, his statement does no longer apply and at the 4 u size, when the wall disappears, the atoms on the surface of coal substance are reacting with steam to form  $H_2$ , and some CO and  $CO_2$  without any char. This then is similar to the steam reforming of oil or natural gas so that at the end of the chemical reaction with 4 u coal we obtain 97%  $H_2$ , the rest being CO and  $CO_2$ . It is on this basis that the Ilok coal produces substantially more hydrogen per T/coal than will be produced under the current program sponsored by the DOE with Air Product & Chemical, Inc.

(4) Regarding the substitute for oil the Director simply blunders by stating: "Ilok is here saying that we can react coal with hydrogen to make synthetic oil. That can be done by using grosser particles (as in current DOE programs) as well with Ilok's very fine particles."

But here the chief scientist of the DOE fails to inform the President that with Ilok's very fine particles up to 4 barrels of synthetic oil per ton of coal are obtained, while the current DOE programs, using grosser coal particles, produce at least 1 barrel of oil less per each 1 ton of coal. Why? Because the current DOE programs are also co-producing the unwanted char. But that is of crucial importance to the USA, because if the USA have only about 1 trillion tons of coal reserves, it follows that with the superior Ilok technology 1 trillion barrels of synthetic oil will be produced on top of what DOE is hoping to obtain under its current coal liquefaction program, which uses an already obsolete technology. If this were not so, why would the Gulf Oil Company's management have offered the Ilok Company a joint venture regarding coal liquefaction based on the Ilok process on March 4, 1974; and was it not proposed that the "glasy char" which Gulf now obtains would no longer trouble "the current DOE program?" And did the Union Carbon and Carbide Company for the same reason not ask for a licence to the Ilok process on February 13, 1975 after the Company received a coal liquefaction contract in excess of \$200 million from DOE? This shows that the substitute for oil cannot be obtained effectively using "grosser particles as in current DOE programs," as the Director of Energy erroneously represents.

(5) On thermal decomposition of coal the White House is also misinformed by the Director.

"Thermal decomposition appears to be the same as pyrolysis: all of the carbon in coal would turn up either in gas, in liquid or in char", states his letter to the White House. But this is not scientifically correct either. We are decomposing the clean 4 u coal with a special kind of pyrolysis but obtaining only pure carbon and hydrogen. "Char" would result only, if any size of coal about 4 micron size would be used. For this reason the process that uses 74 u coal, developed by the U.S. Bureau of Mines, Patent No. 3,424,556, assigned to the United States of America, yields 13% carbon only, but 71% of the unwanted char and 13.2% gas. When this same work is done with the 4 u coal, using the same quality coal, one obtains 75.6% carbon and the rest is  $H_2$ . (See for comparison: Rubber World, June, 1967).

Thus the unscientific letter of the Director of Coal Research of the DOE and my answers show not only scientific incompetence of the scientists of the DOE regarding coal science, but also demonstrates DOE's sharing with the authors of the two spurious papers in the lack of their knowledge about the coal science itself. This hostility or malfeasance and scientific insincerity is furthermore demonstrated by withholding from the White House and from the Congress one very vital fact. They are not informed that all the spurious papers were made without access to the genuine drawings, especially to the master-design of the grinder and without access to engineering specifications. The White House and Congress are not informed that all the unscientific and erroneous objections made against Ilok coal powder technology have been overcome and superceded by the only authoritative evaluation of the Ilok/Rohrbach reductor mill carried out on the basis of a complete disclosure agreement with the prestigious Ohio State University, which confirmed all the basic claims that Ilok Powder Company has been making regarding its unique mill. Why is this most important single bit of information withheld from the President and from Congress? Are all these scientists perhaps afraid that what the DOE is currently developing regarding coal liquefaction or gasification is already becoming an obsolete technology and Congress would not appropriate any funds? Do these scientists fear that 4 micron coal could soon be blended with domestic or imported crude oil for refining, to end our energy shortages?

## VII. THE ROLE OF OHIO STATE UNIVERSITY

Immense praise belongs to the Ohio State University not only for having undertaken the appraisal of the Ilok process without any remuneration but for having demonstrated an unbiased, selfless and objective investigation of the much questioned Ilok process for if it is what it is represented to be, its implications would not only be stunning but also far reaching. The University solved the problem most honorably and saved the good name of American science and technology. But the University did more than that. Disputing earlier claims of the Soo & Rieber and Soehngen papers that the Ilok technique will not work, the outstanding experts and designers of the University on rotary engines, Dr. Jack A. Collins and Dr. Dennis A. Guenther, Department of Mechanical Engineering, found that they could not discover any violation of known physical laws in the Ilok/Rohrbach reductor mill. And, Dr. Donald L. Glower, the excellent Dean of the College of Engineering, declared that he considers the process years ahead of existing technology and that the conclusion of the official Ohio State University study is that "this coal grinding mill can and should be built." The associate Dean, Dr. Robert F. Redmond, said: "Getting coal down to 4 u size, you have access to separation techniques that aren't available to you at the larger sizes, getting out pyrites and ash." As to the organic sulfur removal, Dr. Redmond stated "Even if you did nothing more than get the 4 u coal so that you could remove a good part of organic sulfur, it would be a worthwhile technology." Consequently, the Ohio State University officially confirmed and made public as follows:

- (1) It takes approximately 30 KWH of energy input to reduce 1 ton (2200 lbs) of coal to 4 micron size;
- (2) It takes 1.2 hours to accelerate the rotor of the Ilok/Rohrbach grinder from zero to 10,000 rpm; and
- (3) The coal particles within the mill ejector leave the mill axially while the ash and pyrites (high specific weight) leave the mill radially.

Subsequently, the Dean made a statement in writing that "it is possible to remove most of the pollutants from coal including much of the organic sulfur." With that work of the prestigious Ohio State University "King Coal," the largest energy resource of America, can pull the United States from the bottomless political, strategical, economical and social crisis caused by our chronic fuel shortages.

## VIII. HOW SHOULD THE WINDFALL OIL DECONTROL TAXES BE USED?

Oil decontrol will not by itself increase domestic production of oil. Even if it would, it is estimated that in about 12 years there simply will not by any more oil reserves left at the present rate of oil consumption, unless the American people reduce oil consumption or replace it by synthetic oil from coal or shale. It may, however, give the oil companies windfall profits of up to 86 billion by the year 1985. The decontrol will also boost the price of gasoline, increase the cost of living and aggravate inflation. It is therefore more than proper that a substantial portion of the windfall profits resulting from higher prices of the decontrolled oil should be made available for investments to be made into the many new technologies, such as Ilok coal powder technology, that in the shortest possible time period completely replace the steadily dwindling and one day not existing oil supplies. This must be carried out before the lapse of the 12 year period from now.

On this basis the long term chronic problem in obtaining adequate energy supplies to meet America's needs is no longer a problem, once President Carter's proposed Energy Security Fund is established. Having the best available coal technology at its disposal America will promptly liberate itself from OPEC's energy hegemony and will restore not only its own independence in foreign policy but will also, once more, enter a new age of its unchallenged technological supremacy. Without such technological supremacy and without a plentiful energy, America would soon lose its political, philosophical and economical leadership of the world. But America cannot become an inferior power without its own consent.

Therefore, let's no longer be angry at the White House or at the Energy Department. Let's no longer be angry at Congress. Let's no longer be angry at the oil companies or at the gas dealers, but let's close our ranks for having identified the source for our current oil shortages in the prevention of a substitute for oil caused by a few misguided and mismotivated representatives of American science and technology, be they within or without the Government. Let's realign the

scientific staff of the coal division in the Energy Department, because America must advance into new regions of coal science. If that is not done even the Energy Security Fund will be to no avail, since the accurate scientific background information required by the President and by the Secretary of Energy which influences their decision in the area of energy self-sufficiency of the United States will not be forthcoming, and the funds will only be wasted on obsolete technologies without any progress towards the development of a true substitute for oil. Since I proved that there is a distinct linkage between the spurious papers regarding the Ilok technology and the scientists in the coal division of DOE, it is clear that such a realignment of scientists in the Department of Energy is in the national interest. Emphasis must be on scientists who know not only what there is to know about the coal science that deals with the conventional coal, but that also deals about coal of ultrafine and submicron coal powders, because only such coal is our total answer to the energy problem.

Mr. Chairman, my final point is this: The Bill regarding the use of windfall profits should specify that any corporation and their affiliates, now engaged in oil production should be specifically precluded from the program for the oil synthesis from coal financed by the Energy Security Fund because of obvious conflict of interest and also because the windfall profits they already have, with which they can comfortably finance the development of their own synfuel processes. This will protect the interests of the United States of America.

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## STATEMENT OF DR. FRED SCHULMAN, ENERGY SYSTEMS TECHNOLOGY CORP.

### I. INTRODUCTION

When the OPEC oil cartel, meeting in Geneva June 26-28, raised OPEC oil prices to the level of \$18 to 23.50 per barrel, it became even more important to encourage domestic oil production and to develop energy alternatives. The increases are as large as during the 1973-74 embargo and amount to an average increase of 54 percent over the average OPEC price of 12.98 per barrel in December 1978. This Committee could perform a great service for all Americans if its recommendations on energy tax policy accomplishes this important goal.

A "windfall tax" becomes unnecessary to protect the public from decontrol of oil prices if this Committee can devise effective constraints to OPEC price increases. Without such constraints, decontrol could set off a monotonic upward spiral of further inflation and OPEC price increases. This statement, therefore, will be confined to a discussion of credible constraints to replace "windfall profits" within a combined decontrol-rising OPEC price situation, such as exists today. If this can be achieved, market forces will, to a large degree, replace cartel pricing.

### II. DECONTROL

Decontrol is intended to achieve two important goals. First, the resulting higher prices should stimulate some conservation. Second, imports are supposed to be reduced because domestic production should be increased and the higher prices should encourage development of a synthetic fuels industry. But if, under present circumstances, neither goal is achieved to a significant degree, then either the inflationary price becomes too high to pay or the conditions should be changed so that decontrol will work.

OPEC has set in motion an upward moving price target for decontrol. At an estimated average 1979 price of \$20.00 per barrel, it will receive an additional \$77 billion world-wide, of which more than \$20 billion will come from American consumers. Our total oil import bill in 1979 will now exceed \$60 billion. This is a terrible tax to pay and it should not be paid. There is a better way.

### III. INFLATIONARY ASPECTS

At this point, it is important to clarify a popular misconception about the impact of OPEC oil on the rate of inflation in the United States. It is customary to say that the consumer price index will rise only one or two percent due to the cartel's action in raising prices. The rationale is that energy expenditures account for only about 8 percent of the CPI, with oil only half of that amount, or only 4 percent. Thus, the reasoning goes, even if oil prices are doubled, the inflation rate will be increased by only 4 percent. The fallacy, of course, is that the OPEC price is established by a cartel of sovereign nations having political, economic,

and diplomatic power to maintain that price. The OPEC price then becomes a benchmark, which is unbalanced until other prices rise to their equivalent value to oil. Such equivalent-value-to-oil increases for manufactured goods and services take time but they insure not only high inflation, (up to about 75 percent of today's CPI at equilibrium) but also render all but impossible the economic production of substitute fuels.

#### IV. SUBSTITUTE FUELS—SHALE OIL

Development of shale oil is a good example. On October 1, 1973, it was estimated that shale oil could be produced for about \$6 to \$7 per barrel. At that time, the posted price of Saudi light crude was \$3.01 per barrel, and domestic oil cost about \$3.89 per barrel. On January 1, 1974, during the Arab oil embargo, Saudi oil had risen to \$11.65 per barrel, and domestic oil had increased to \$6.74 per barrel. Sensing competitive shale oil prices, several major oil companies entered spirited bidding to obtain large shale tracts on private and federal lands in Colorado. But shale oil plants never were built despite constantly rising domestic and OPEC oil prices. According to data of Rand Corporation and American Petroleum Institute, published by Business Week on April 23, 1979, the estimated competitive shale oil price rose in tandem with OPEC so that the economic crossover point never has been reached. According to Business Week, the estimated price shale oil must bring in order to be produced profitably rose year by year from a range of \$6-\$7 per barrel in 1973 to \$18 per barrel in 1975, and to about \$22 per barrel in 1977. Today, shale oil would cost an estimated \$26 per barrel. With the new OPEC price increase added to the continuing inflationary effects lingering from the four-fold increases of 1973, the estimated price of shale oil jumps to about \$46 per barrel in 1983. Thus, shale oil remains uncompetitive and unproduced.

#### V. SUBSTITUTE FUEL INDUSTRY NEED OPEC PRICE CONSTRAINTS

Similar reasoning accounts for the facts that coal conversion to oil and gas, solar, geothermal, biomass conversion and other energy alternatives have all faltered on cost grounds. As shown in the case of shale, the costs of these alternatives constitute a moving upward target, as long as OPEC oil is unrestrained by the United States. Thus, for every \$1 rise in OPEC oil prices, U.S. coal prices rise \$4 per ton, natural gas rises 17¢ per mcf, and domestic oil rises by \$1 per barrel after decontrol. These are simply the heating equivalent of these fuels and represent equivalent costs per Btu. As is well known, the Carter Energy Plans aim at reaching fuel price equivalency and reaches that goal by a system of taxes and credits. When, in 1977, the Department of Energy approved importation of liquefied natural gas (LNG) from Algeria at \$4.50 per mcf, it sent a signal to OPEC that the United States was willing to accept an oil price as high as \$25.71 per barrel (the oil equivalent of \$4.50 gas). The newly adopted ceiling of \$23.50 per barrel indicates that OPEC has read the signal and has heeded it.

What this means is that without effective constraint on OPEC price increases, no oil substitutes and no synthetic fuels industry will be viable. If we fail to heed this clear and present danger to our economy and security, we will become more and more dependent on OPEC sufferance for our very survival. This need not and should not happen.

#### VI. ENERGY AND TAX POLICY RECOMMENDATIONS

First, it is of highest priority to increase incentives for production of U.S. oil, not OPEC oil. In the tax field, in lieu of any windfall tax, the present multibillion foreign oil tax credit should be repealed by appropriate legislation. Such OPEC tax credits amount to a current and deferred taxpayer subsidy of wealthy OPEC nations of \$15 billion or more. Since these credits increase with rising prices, what incentive is there for oil companies to try to persuade OPEC countries to moderate their prices? Recent hearings by the House Government Operations Committee show that foreign oil tax credits favor importation of OPEC oil over production of domestic, Alaskan or non-OPEC oil and are a powerful force for maintaining the cartel's grip on the United States. It is clear that decontrol without repeal of the foreign tax credit will provide a strong incentive to increase OPEC oil imports, not decrease them. Since after decontrol, domestic oil prices will rise to the cartel price, OPEC oil will become cheaper because it enjoys the credit. U.S. refineries will therefore tend to choose OPEC oil over domestic oil because of cost. Furthermore, feedstock costs to the U.S. petrochemical industry will rise making the industry less competitive with foreign operations. According to Chemical &



Engineering News of June 1, 1979, lower American feed stock costs helped increase chemical exports to Western Europe by 14 percent, to Asia by 38 percent and to Africa by 36 percent. These will become imperiled. My testimony to this Committee during its hearings on the 1975 Energy Conservation and Conversion Act discusses other effects on American industry, jobs, and the economy of OPEC oil price increases.

Second, a better method than the present system of OPEC dictation to multinational oil companies must be devised to negotiate access to OPEC oil at reasonable prices. Vesting import authority in the U.S. Special Trade Representative or establishment of a National Oil Import Corporation are concepts whose merits in restraining OPEC should be considered. American strengths in trade, technology and food should not be overlooked in dealing for OPEC oil.

Finally, countervailing tax levies on exports to OPEC equivalent to OPEC price increases and surcharges could well be the quickest method of reducing or eliminating unwarranted oil price increases. In the case of Saudi Arabia, which increased prices of oil exports by 42 percent, a counterlevy of 42 percent would apply on all exports to that country. Similarly, the other OPEC countries would be required to pay a counterlevy of 54 percent. A portion of the tax revenues paid by OPEC could be refunded to American farmers and business. While such a countertax strategy would have been most effective if all seven allied nations meeting in the Tokyo summit at the time of the huge OPEC increases, had adopted and announced and announced a policy of counterlevy, still the Committee on Finance could send a powerful signal to OPEC by recommending such a counterlevy. Such a move by this Committee could at one stroke eliminate the gloom and doom now overhanging much of U.S. energy policy. It could electrify the country by this show of leadership into regaining control of its own economic and political destiny.

#### VI. CONCLUSION

If the energy crisis is the moral equivalent of war, it is time to engage in a fair fight to win.

