

# FISCAL POLICY AND THE ENERGY CRISIS

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HEARINGS  
BEFORE THE  
SUBCOMMITTEE ON ENERGY  
OF THE  
COMMITTEE ON FINANCE  
UNITED STATES SENATE  
NINETY-THIRD CONGRESS  
FIRST AND SECOND SESSIONS

ON

**S. 2806**

ENERGY REVENUE AND DEVELOPMENT ACT OF 1973

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NOVEMBER 27, 28, AND 29, 1973 ; JANUARY 23, 24, 25, 28, AND 29, 1974

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**Part 3 of 4 Parts**  
**(January 23 and 24, 1974)**

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(II)

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# FISCAL POLICY AND THE ENERGY CRISIS

WEDNESDAY, JANUARY 23, 1974

U.S. SENATE,  
SUBCOMMITTEE ON ENERGY  
OF THE COMMITTEE ON FINANCE,  
*Washington, D.C.*

The subcommittee met, pursuant to notice, at 2 p.m., in room 2228, Dirksen Senate Office Building, Senator Mike Gravel [chairman of the subcommittee] presiding.

Present: Senators Gravel and Dole.

Senator GRAVEL. The hearings will come to order.

Today we begin our second round of hearings on how fiscal and trade policies can be used to determine national energy programs.

First, I must apologize for the reordering of the agenda for today's and tomorrow's sessions. The full Senate Finance Committee today concluded 2 days of hearings on the excess profits tax provisions of the emergency energy bill. These hearings were scheduled hastily so as to have the benefit of a committee hearing record when the bill is considered in the Senate this week and next week. Accordingly, the hearings of this subcommittee were postponed until this hour.

I want to thank today's witnesses for their patience and willingness to reschedule in this fashion. William Simon, who was to have testified this morning before the subcommittee, instead appeared before the full committee. He has very graciously agreed to return tomorrow morning at 9:30 so the subcommittee can have the benefit of his wisdom on the matters before us.

There is no issue more urgent today than the establishment of a coherent energy policy. We must look to the long-term development of our energy resources, as well as to the short-term management of the energy shortages.

For the long term, I have suggested a number of steps embodied in S. 2806, the Energy Revenue and Development Act. These steps could lead the Nation to energy self-sufficiency in a decade. Among other things, it would create an energy trust fund, a concept that has been advanced by Senator Marlow Cook of Kentucky.

In the course of these hearings over the next 5 days, we shall also focus attention on the removal of price controls over the energy sector and on the regulation of natural gas prices. We shall be considering tax measures aimed at increasing energy supplies, sections for residential energy conservation and proposals for taxing excess profits.

In addition, we will give some attention to the situation with our reserves and the production of energy on nonpublic lands. Another area is the administration of a trust fund that Senator Cook and I

hope to create and the establishment of a public watchdog panel over energy research and development.

In the trade area, we shall devote our attention to the establishment of a variable levy on imported energy, a quota on certain imports, methods for negotiating the price of imported fuels, and controls on the exports of our domestic supply.

I hope that these hearings can produce comprehensive legislation that can come before the Senate in this session.

At this point in the record we will insert the bill, S. 2806, a summary of the bill and my floor statement introducing the bill, and the press release announcing these hearings.

[The material referred to follows. Oral testimony begins on p. 1031.]

PRESS RELEASE

FOR IMMEDIATE RELEASE  
January 15, 1974

COMMITTEE ON FINANCE  
Subcommittee on Energy  
2227 Dirksen Senate Office Bldg.

GRAVEL ANNOUNCES HEARINGS ON EXCESS PROFITS TAX  
AND ENERGY TRUST FUND

Senator Mike Gravel (D., Alaska), Chairman of the Subcommittee on Energy of the Senate Committee on Finance, today announced that hearings on the energy crisis will resume on January 23, 24, 25, 28, and 29, 1974. The hearings will focus on "The Energy Revenue and Development Act," introduced by Senator Gravel and on other legislation employing fiscal and trade measures to deal with the energy crisis.

The Senator said the hearings will devote special attention to the establishment of an excess profits tax and an energy trust fund, among other proposals.

The following witnesses will appear:

January 23, 1974

The Honorable Marlow W. Cook  
United States Senate

The Honorable William E. Simon  
Administrator  
Federal Energy Office

Mr. John Miller  
President  
Independent Petroleum Association of America

Mr. Warren Tomlinson  
President

(and) Mr. Don Schnacke  
Executive Vice President  
Kansas International Oil and Gas Association

January 24, 1974

The Honorable John Nassikas  
Chairman  
Federal Power Commission

(and) Mr. J. P. Hammond  
Mr. Kenneth C. Vaughan  
(on behalf of)  
Gas Supply Committee

Mr. John Partridge  
(on behalf of )  
American Gas Association

January 25, 1974

The Honorable Dixy Lee Ray  
Chairman  
U. S. Atomic Energy Commission

The Honorable Walter E. Rogers  
President  
Interstate Natural Gas Association

Mr. J. Hilbert Anderson

Professor James C. Cox  
Department of Economics  
University of Massachusetts

January 28, 1974

The Honorable Carl Bagge  
President  
National Coal Association

Professor William E. Heronemus  
Department of Civil Engineering  
University of Massachusetts

Dr. Joseph Lindmayer  
President  
Solarex Corporation

Dr. V. Stephan Krajcovic  
President  
Ilok Power Company

January 29, 1974

Professor Robert Engler  
Political Science Department  
City University of New York

Professor Dale Jorgenson  
Department of Economics  
Harvard University

Fritz R. Huntsinger, Jr.  
President  
VETCO Offshore Industries, Inc.

Chairman Gravel noted that at the close of the last session of Congress tax proposals dealing with "excess" or "windfall" profits were being voted on by the Senate without the benefit of any hearings by the Committee on Finance.

"It is crucial," he emphasized, "that any excess or windfall profits tax that is enacted be drafted so that so that energy production is encouraged."

He stated his hope that the witnesses will address the specifics of any such tax since this issue will be taken up by the Senate soon as the Congress returns. The Senator's bill includes an excess profits section.

Senator Gravel said that the hearings will also give attention to other proposals contained in his bill, including:

- \* the creation of an energy trust fund to finance the government's efforts in energy research and development;
- \* the removal of price controls from the energy sector, including the deregulation of natural gas prices;
- \* the establishment of a variable import levy on energy, a quota on imports, and controls on exported fuels;
- \* tax measures aimed at increasing domestic energy development; and
- \* residential energy conservation tax incentives.

Because of time pressures, the Subcommittee is not able at this time to hear all those persons it wanted to have participate. However, those persons or institutions who wish to submit statements for the record are invited to do so.

Statements submitted for inclusion in the record should be typewritten on not more than 25 double-spaced pages and mailed by February 8, 1974 to Robert A. Best, Chief Economist, Senate Committee on Finance, 2227 Dirksen Senate Office Building, Washington, D. C. 20510.

The hearings will begin at 9:30 a. m. , Wednesday, January 23, in Room 2221, Dirksen Senate Office Building. Hearings on the 24, 25, 28, and 29, will begin at 10:00 a. m. unless announced otherwise by the Chairman.

Witnesses appearing at the public hearing should submit 100 copies, one day in advance of their testimony, with a summary of the principal points. Those who will submit statements for the record should send 5 copies plus the original by February 8.

93<sup>d</sup> CONGRESS  
1<sup>ST</sup> SESSION

# S. 2806

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## IN THE SENATE OF THE UNITED STATES

DECEMBER 13, 1973

Mr. GRAVEL introduced the following bill; which was read twice and referred to the Committee on Finance

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## A BILL

To establish an Energy Trust Fund funded by a tax on energy sources, to establish a Federal Energy Administration, to provide for the development of domestic sources of energy and for the more efficient utilization of energy, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*  
2 *tives of the United States of America in Congress assembled,*

3 TITLE I—SHORT TITLE; STATEMENT OF POLICY

4 AND PURPOSES

5 SHORT TITLE

6 SEC. 101. This Act may be cited as the “Energy Reve-  
7 nue and Development Act of 1973”.

II



## 2

## 1 STATEMENT OF POLICY AND PURPOSES

2 SEC. 102. The Congress finds and declares that—

3 (1) It is the policy of the United States to achieve  
4 energy independence by 1985 and to reduce progressively  
5 the dependence of the United States on foreign sources of  
6 energy between now and that date.

7 (2) The achievement of this goal is essential for the  
8 Nation's economic growth, full employment, balance-of-pay-  
9 ments equilibrium, and national security.

10 (3) A well-coordinated and defined national energy  
11 policy is needed to achieve energy independence by 1985.  
12 Such a policy must be implemented by a central Federal  
13 authority which would coordinate and define all energy  
14 policies and programs. An independent commission of qual-  
15 ified scientists, engineers, and economists is needed to ad-  
16 vise and assist this authority and publicly evaluate its poli-  
17 cies and programs.

18 (4) The United States, including its Continental Shelf,  
19 has an enormous energy resource base, including an estimated  
20 three hundred and forty-six billion barrels of oil; one thou-  
21 sand one hundred and seventy-eight trillion cubic feet of  
22 natural gas; three hundred and ninety-four billion tons of  
23 coal; one and six-tenths million tons of uranium; and one  
24 hundred and eighty-nine billion barrels of oil shale. Rapid  
25 development of these massive energy sources is imperative.

## 3

1       (5) While developing fully these resources, the public  
2 and private sectors must develop alternative sources of en-  
3 ergy including solar energy, wind, geothermal energy, ocean  
4 thermal gradients, coal gasification and liquefaction, nuclear  
5 fusion and fission, the conversion of organic materials to  
6 energy, and others.

7       (6) Achieving energy independence requires a massive  
8 investment of capital and technology over the next decade.

9       (7) Adequate and assured public financing of research  
10 and development programs requires the imposition of taxes  
11 on energy sources and the appropriation of the revenues  
12 from these taxes to a special energy trust fund.

13       (8) The private market must be allowed to operate  
14 freely in order to attract capital for the development of  
15 our indigenous energy resources. Accordingly, energy inde-  
16 pendence requires that price controls be phased out on petro-  
17 leum and petroleum products, natural gas, and coal, and  
18 immediately terminated on essential articles needed in the  
19 extraction, refining, and transportation of petroleum and gas  
20 and the extraction of coal, subject to safeguards to assure  
21 that termination of such controls does not result in excessive  
22 profits.

23       (9) Foreign energy resources have proven to be an un-  
24 reliable source of supply. In order to attract the capital nec-  
25 essary for the development of secure domestic resources, it

1 will be necessary to impose variable duties on imported pe-  
 2 troleum and petroleum products from all countries, and quota  
 3 limitations on petroleum and petroleum products imported  
 4 from foreign countries which have embargoed shipments of  
 5 petroleum to the United States.

6 (10) The granting of tax incentives to stimulate the  
 7 domestic production of petroleum and coal, and the removal  
 8 of tax incentives which encourage foreign production of pe-  
 9 troleum by American companies, are necessary components  
 10 of a national energy policy.

11 TITLE II—ENERGY TRUST FUND; TAX ON  
 12 ENERGY SOURCES  
 13 ENERGY TRUST FUND

14 SEC. 201. (a) ESTABLISHMENT OF TRUST FUND.—  
 15 There is hereby established in the Treasury of the United  
 16 States a trust fund to be known as the Energy Trust Fund  
 17 (hereafter in this section referred to as the “trust fund”).  
 18 The trust fund shall consist of such amounts as may be ap-  
 19 propriated or credited to it as provided in this section.

20 (b) TRANSFER OF AMOUNTS TO TRUST FUND.—

21 (1) IN GENERAL.—There are hereby appropriated  
 22 to the trust fund amounts equivalent to the taxes re-  
 23 ceived in the Treasury under section 4496 of the Inter-  
 24 nal Revenue Code of 1954 (tax on energy sources).

25 (2) METHOD OF TRANSFER.—The amounts appro-

## 5

1        priated by paragraph (1) shall be transferred at least  
2        monthly from the general fund of the Treasury to the  
3        trust fund on the basis of estimates by the Secretary of  
4        the Treasury of the amounts referred to in paragraph  
5        (1) received in the Treasury. Proper adjustments shall  
6        be made in the amounts subsequently transferred to the  
7        extent prior estimates were in excess of or less than the  
8        amounts required to be transferred.

9        (c) APPROPRIATION OF ADDITIONAL SUMS.—There  
10       are hereby authorized to be appropriated to the trust fund  
11       such additional sums as may be required to make expendi-  
12       tures referred to in subsection (e) (1) of this section.

13       (d) MANAGEMENT OF THE TRUST FUND.—

14                (1) IN GENERAL.—It shall be the duty of the Sec-  
15       retary of the Treasury to manage the trust fund and  
16       (after consultation with the Administrator of the Fed-  
17       eral Energy Administration) to report to the Congress  
18       not later than the 1st day of March of each year on  
19       the financial condition and the results of the opera-  
20       tions of the trust fund during the preceding fiscal year  
21       and on its expected condition and operations during  
22       each fiscal year thereafter. Such report shall include the  
23       recommendations of the Administrator of the Federal  
24       Energy Administration as to the amount of revenues

## 6

1 needed by the trust fund during the following fiscal year  
2 to meet expenditures from the trust fund during such  
3 fiscal year. Such report shall be printed as a House  
4 document of the session of the Congress to which the  
5 report is made.

6 (2) INVESTMENT.—It shall be the duty of the Sec-  
7 retary of the Treasury to invest such portion of the  
8 trust fund as is not, in his judgment, required to meet  
9 current withdrawals. Such investments may be made  
10 only in interest-bearing obligations of the United States  
11 or in obligations guaranteed as to both principal and  
12 interest by the United States. For such purpose such  
13 obligations may be acquired (A) on original issue at  
14 the issue price, or (B) by purchase of outstanding  
15 obligations at the market price. The purposes for which  
16 obligations of the United States may be issued under  
17 the Second Liberty Bond Act, as amended, as hereby  
18 extended to authorize the issuance at par of special  
19 obligations exclusively to the trust fund. Such special  
20 obligations shall bear interest at a rate equal to the  
21 average rate of interest, computed as to the end of the  
22 calendar month next preceding the date of such issue,  
23 borne by all marketable interest-bearing obligations of  
24 the United States then forming a part of the public  
25 debt; except that where such average rate is not a

1 multiple of one-eighth of 1 percent, the rate of interest  
2 of such special obligations shall be the multiple of one-  
3 eighth of 1 percent next lower than such average rate.  
4 Such special obligations shall be issued only if the Sec-  
5 retary of the Treasury determines that the purchase of  
6 other interest-bearing obligations of the United States,  
7 or of obligations guaranteed as to both principal and  
8 interest by the United States on original issue or at the  
9 market price, is not in the public interest.

10 (3) SALE OF OBLIGATIONS.—Any obligation ac-  
11 quired by the trust fund (except special obligations issued  
12 exclusively to the trust fund) may be sold by the Secre-  
13 tary of the Treasury at the market price, and such special  
14 obligations may be redeemed at par plus accrued interest.

15 (4) INTEREST AND CERTAIN PROCEEDS.—The in-  
16 terest on, and the proceeds from the sale or redemption  
17 of, any obligations held in the trust fund shall be credited  
18 to and form a part of the trust fund.

19 (c) EXPENDITURES FROM THE TRUST FUND.—

20 (1) ENERGY PROGRAMS.—Amounts in the trust  
21 fund shall be available, as provided by appropriation  
22 Acts for making expenditures to carry out the provisions  
23 of titles III and IV of this Act.

24 (2) REFUNDS OF TAXES.—The Secretary of the  
25 Treasury shall pay from time to time from the trust fund

1 into the general fund of the Treasury amounts equal to  
 2 the amounts of refunds or credits of overpayments of  
 3 the tax imposed by section 4496 of the Internal Revenue  
 4 Code of 1954.

5 **TAX ON ENERGY SOURCES**

6 **SEC. 202. (a) IMPOSITION OF EXCISE TAX ON ENERGY**  
 7 **SOURCES.**—Chapter 36 of the Internal Revenue Code of 1954  
 8 (relating to certain other excise taxes) is amended by add-  
 9 ing at the end thereof the following new subchapter:

10 **“Subchapter F—Tax on Energy Sources**

“Sec. 4496. Imposition of taxes.

“Sec. 4497. Definitions; special rules.

“Sec. 4498. Certifications by Federal Energy Administrator.

“Sec. 4499. Cross reference.

11 **“SEC. 4496. IMPOSITION OF TAXES.**

12 **“(a) IMPOSITION OF TAXES.**—There is hereby im-  
 13 posed, at the rate provided in subsection (b) —

14 **“(1)** upon the extraction of oil, gas, or coal within  
 15 the United States, a tax on the Btu content of the oil,  
 16 gas, or coal,

17 **“(2)** upon the production of electricity (or other  
 18 consumable energy) within the United States using any  
 19 energy source other than oil, gas, or coal, or any  
 20 product or derivative thereof, a tax on the Btu content  
 21 equivalent of the energy source, and

22 **“(3)** upon the importation into the United States of

1 oil, gas, or coal, or any product or derivative thereof,  
 2 a tax on the Btu content of the oil, gas, coal, product,  
 3 or derivative.

4 “(b) RATES OF TAX.—The rate of tax referred to in  
 5 subsection (b) is—

“For the one-year period beginning on :	Per 1,000,000 Btu content (or Btu content equivalent) :
July 1, 1974.....	4.1 cents.
July 1, 1975.....	4.5 cents.
July 1, 1976.....	5.2 cents.
July 1, 1977.....	5.9 cents.
July 1, 1978.....	6.5 cents.
July 1, 1979.....	5.9 cents.
July 1, 1980.....	5.2 cents.
July 1, 1981.....	4.5 cents.
July 1, 1982.....	4.1 cents.
July 1, 1983.....	3.4 cents.
July 1, 1984.....	2.8 cents.

10 “(c) BY WHOM PAID.—The tax imposed by subsec-  
 11 tion (a) (1) shall be paid by the person who extracts the  
 12 oil, gas, or coal. The tax imposed by subsection (a) (2)  
 13 shall be paid by the person who produces the electricity  
 14 or other consumable energy. The tax imposed by subsec-  
 15 tion (a) (3) shall be paid by the importer.

16 **“SEC. 4497. DEFINITIONS; SPECIAL RULES.**

17 “For purposes of this subchapter—

18 “(a) BTU.—The term ‘Btu’ means the quantity of  
 19 heat required to raise the temperature of one pound of water  
 20 one degree Fahrenheit at or near its point of maximum  
 21 density.

22 “(b) BTU CONTENT.—The Btu content of oil, gas,  
 23 and coal extracted within the United States, and of oil, gas,



1 and coal, and any product or derivative thereof, imported  
2 into the United States, shall be determined on the basis  
3 of certifications of the Administrator of the Federal Energy  
4 Administration under section 4498 (a) .

5 “(c) **BTU CONTENT EQUIPMENT.**—The Btu content  
6 equivalent of energy sources of electricity (or other con-  
7 sumable energy) produced within the United States shall  
8 be determined on the basis of certifications of the Admin-  
9 istrator of the Federal Energy Administration under section  
10 4498 (b) .

11 “(d) **UNITED STATES.**—The term ‘United States’ has  
12 the meaning given to it by section 638 (1) .

13 **“SEC. 4498. CERTIFICATIONS BY FEDERAL ENERGY AD-  
14 MINISTRATOR.**

15 “(a) **FOSSIL FUELS.**—The Administrator of the Fed-  
16 eral Energy Administration shall—

17 “(1) establish classifications or grades for—

18 “(A) oil, gas, and coal extracted within the  
19 United States, and

20 “(B) oil, gas, and coal, and products and de-  
21 rivatives thereof, imported into the United States,  
22 and

23 “(2) from time to time, certify to the Secretary or  
24 his delegate, for purposes of applying the taxes imposed  
25 by sections 4496 (a) (1) and 4496 (a) (3) , the average

1 Btu content for each class or grade so established.

2 “(b) **OTHER ENERGY SOURCES.**—The Administrator  
3 of the Federal Energy Administration shall, from time to  
4 time, determine and certify to the Secretary or his delegate,  
5 with respect to electricity (or other consumable energy)  
6 produced from any source other than oil, gas, or coal, or any  
7 product or derivative thereof, the average Btu content of  
8 the quantity of oil, gas, or coal which would be required, if  
9 used as the energy source, to produce the same number  
10 of kilowatts of electricity (or the same number of units of  
11 other energy). For purposes of applying the tax imposed by  
12 section 4496 (a) (2), the Btu content equivalent of elec-  
13 tricity produced in any geographic area shall be based on  
14 the fossil fuel energy source predominantly used for the  
15 production of electricity in the same geographic area.

16 **“SEC. 4499. CROSS REFERENCE.**

**“For penalties and administrative provisions applic-  
able to this subchapter, see subtitle F.”.**

17 (b) **CLERICAL AMENDMENT.**—The table of subchap-  
18 ters for chapter 36 of the Internal Revenue Code of 1954 is  
19 amended by adding at the end thereof the following new  
20 item:

**“Subchapter F. Tax on energy sources.”.**

## 1 TITLE III—FEDERAL ENERGY ADMINISTRATION

## 2 ESTABLISHMENT

3 SEC. 301. (a) There is established the Federal Energy  
4 Administration (hereinafter called the "Administration").  
5 The Administration shall be headed by an Administrator  
6 (hereinafter referred to as the "Administrator"), who shall  
7 be appointed by the President of the United States, by and  
8 with the advice and consent of the Senate. Under the super-  
9 vision and direction of the President, the Administrator shall  
10 be responsible for the exercise of all powers and the dis-  
11 charge of all duties of the Administration, and shall have  
12 authority and control over all personnel and activities  
13 thereof.

14 (b) There shall be in the Administration a Deputy  
15 Administrator, who shall be appointed by the President, by  
16 and with the advice and consent of the Senate, and who  
17 shall perform such duties and exercise such powers as the  
18 Administrator may prescribe. The Deputy Administrator  
19 shall act for, and exercise the powers of, the Administrator  
20 during his absence or disability.

21 (c) The Administrator and the Deputy Administrator  
22 shall not engage in any other business, vocation, or employ-  
23 ment while serving as such.

## 24 NATIONAL ENERGY PROGRAM

25 SEC. 302. (a) The Administration, in order to carry  
26 out the purposes of this Act, shall develop, direct, and carry

1 out a national energy program involving energy research,  
2 demonstration, development, utilization, and conservation in  
3 order to meet the present and future energy needs of the  
4 United States.

5 (b) In carrying out its functions the Administration  
6 shall—

7 (1) develop the technology and information base  
8 necessary to support development of the widest possible  
9 range of options available for future energy policy deci-  
10 sions of the United States by pursuing research, demon-  
11 stration, and development programs in a wide variety  
12 of energy technologies with a view to progressively  
13 reducing the dependency of the United States on foreign  
14 sources of energy so that by 1985, imports of energy will  
15 be less than 5 per centum of domestic consumption;

16 (2) provide for the assessment, overview, and di-  
17 rection of the energy research and development activi-  
18 ties of the Federal Government with a view to assuring  
19 adequate, reliable, economical, and environmentally ac-  
20 ceptable energy systems to support the essential needs,  
21 present and future, of the United States;

22 (3) encourage the conservation of limited energy  
23 resources and maximize the efficiency of energy devel-  
24 opment, production, conversion, and use;

25 (4) provide the most effective short-term solutions

1 to immediate energy shortage problems which are hav-  
2 ing serious impacts upon the Nation; and

3 (5) formulate and carry out a comprehensive en-  
4 ergy research, development, and demonstration pro-  
5 gram which (A) will advance the policies and purposes  
6 of this Act, (B) is designed to make available to Amer-  
7 ican consumers domestic fossil fuels, nuclear fuels, geo-  
8 thermal energy, and the potentially unlimited reserves  
9 of solar power, tidal power, and other unconventional  
10 sources of energy, and (C) will insure that full consid-  
11 eration and adequate support is given to—

12 (i) improving the efficiency, conservation, and  
13 environmental effects of the conventional sources of  
14 energy, including discovery, production, conversion,  
15 transportation, and use, and the disposal of waste  
16 products;

17 (ii) advancing energy research, development,  
18 and demonstration of unconventional energy sources  
19 and technologies, including, but not limited to, solar  
20 energy, geothermal energy, magnetohydrodynamics,  
21 nuclear fusion and fission processes, fuel cells, low  
22 head hydroelectric power, use of agricultural prod-  
23 ucts for energy, tidal power, ocean current and  
24 thermal gradient power, wind power, automated  
25 mining methods and in situ conversion of fuels, cryo-

1           genic transmission of electric power, electrical energy  
2           storage methods, alternatives to internal combustion  
3           engines, solvent refined coal, utilization of waste  
4           products for fuels, and direct conversion methods;  
5           and

6           (iii) improving management techniques and the  
7           effectiveness of management of existing energy sys-  
8           tems through quality control; application of sys-  
9           tems analysis, communications, and computer tech-  
10          niques; and public information to improve the relia-  
11          bility and efficiency of energy supplies and encourage  
12          the conservation of energy resources.

13                           AUTHORITY OF ADMINISTRATION

14          SEC. 303. (a) In the performance of its functions the  
15          Administration is authorized—

16                   (1) to make, promulgate, issue, rescind, and amend  
17                   rules and regulations governing the manner of its opera-  
18                   tions and the exercise of the powers vested in it by law;

19                   (2) to appoint and fix the compensation of such  
20                   officers and employees as may be necessary to carry out  
21                   such functions, and, to the extent that it determines  
22                   such action necessary to the discharge of its respon-  
23                   sibilities, to appoint, without regard to the provisions  
24                   of title 5, United States Code, governing appointments in  
25                   the competitive service, scientific, engineering, and

1 administrative personnel and compensate such scientific,  
2 engineering, and administrative personnel without regard  
3 to the provisions of chapter 51 and subchapter III of  
4 chapter 53 of such title relating to classification and  
5 General Schedule pay rates, but in no event in excess of  
6 the maximum rate for GS-18 of the General Schedule  
7 under section 5332 of title 5, United States Code;

8 (3) to acquire (by purchase, lease, condemnation,  
9 or otherwise), construct, improve, repair, operate, and  
10 maintain laboratories, research and testing sites and  
11 facilities, vehicles, quarters and related accommoda-  
12 tions for employees and dependents of employees of the  
13 Administration, and such other real and personal prop-  
14 erty (including patents), or any interest therein, as the  
15 Administration deems necessary within the continental  
16 United States; to acquire by lease or otherwise,  
17 through the Administrator of General Services, build-  
18 ings or parts of buildings in the District of Columbia for  
19 the use of the Administration for a period not to exceed  
20 ten years without regard to the provisions of the first  
21 section of the Act of March 3, 1877 (40 U.S.C. 34) ; to  
22 lease to others such real and personal property; to sell  
23 and otherwise dispose of real and personal property  
24 (including patents and rights thereunder) in accordance  
25 with the provisions of the Federal Property and Ad-

1       ministrative Services Act of 1949, as amended; and to  
2       provide by contract or otherwise for cafeterias and other  
3       necessary facilities for the welfare of employees of the  
4       Administration at its installations, and purchase and  
5       maintain equipment therefor;

6               (4) to accept unconditional gifts or donations of  
7       services, money, or property, real, personal, or mixed,  
8       tangible or intangible;

9               (5) without regard to section 3648 of the Revised  
10       Statutes (31 U.S.C. 529), to enter into and perform  
11       such contracts, leases, cooperative agreements, or other  
12       transactions, and to make such grants, all in consulta-  
13       tion with the Commission on Energy Technology Assess-  
14       ment established pursuant to title IV of this Act, as may  
15       be necessary in the conduct of its work and on such terms  
16       as it may deem appropriate, with any agency or instru-  
17       mentality of the United States, or with any State, terri-  
18       tory, or possession of the United States, or with any polit-  
19       ical subdivision thereof, or with any person, firm, as-  
20       sociation, corporation, or educational institution. To the  
21       maximum extent practicable and consistent with the  
22       accomplishment of the purposes of this Act, such con-  
23       tracts, leases, agreements, and other transactions shall  
24       be allocated by the Administrator in a manner which  
25       will enable small-business concerns to participate equi-



1 tably and proportionately in the conduct of the work of  
2 the Administration;

3 (6) to enter into a contract or other agreement with  
4 any person, firm, association, corporation, or other en-  
5 tity, pursuant to which contract or agreement (A) such  
6 person, firm, association, corporation, or entity shall be  
7 authorized to design, construct, operate, and maintain a  
8 demonstration-type, or full-scale, commercial-size facility  
9 to produce energy from oil shale, coal gasification, solar  
10 power, tidal power, or other unconventional sources of  
11 energy and (B) the Administration would be author-  
12 ized to financially assist in the designing and construc-  
13 tion of any such facility by means of a loan guarantee  
14 in accordance with the provisions of section 304 of this  
15 Act;

16 (7) to enter into a contract or other agreement  
17 with any person, firm, association, corporation, or other  
18 legal entity engaged in the prospecting, exploration, de-  
19 velopment, or production of oil or natural gas in accord-  
20 ance with the mining or mineral leasing laws of the  
21 United States, pursuant to which the Administration  
22 shall financially assist such person, firm, association, cor-  
23 poration, or entity in carrying out such prospecting, ex-  
24 ploration, development, or production by means of a loan

## 19

1       guarantee in accordance with the provisions of section  
2       304 of this Act;

3               (8) to use, with their consent, the services, equip-  
4       ment, personnel, and facilities of Federal and other agen-  
5       cies with or without reimbursement, and on a similar  
6       basis to cooperate with other public and private agen-  
7       cies, institutions, and instrumentalities in the use of serv-  
8       ices, equipment, and facilities. Each department and  
9       agency of the Federal Government shall cooperate fully  
10      with the Administration in making its services, equip-  
11      ment, personnel, and facilities available to the Adminis-  
12      tration;

13              (9) to appoint, in accordance with the applicable  
14      provisions of the Federal Advisory Committee Act, such  
15      advisory committees as may be appropriate for purposes  
16      of consultation and advice to the Administration in the  
17      performance of its functions;

18              (10) to establish within the Administration such  
19      offices and procedures as may be appropriate to provide  
20      for the greatest possible coordination of its activities  
21      under this Act with related scientific and other activi-  
22      ties being carried on by other public and private agen-  
23      cies, institutions, and instrumentalities;

24              (11) to obtain services of experts and consultants

1 in accordance with section 3109 of title 5, United States  
2 Code;

3 (12) (A) to consider, ascertain, adjust, determine,  
4 settle, and pay, on behalf of the United States, in full  
5 satisfaction thereof, any claim for \$5,000 or less against  
6 the United States for bodily injury, death, or damage  
7 to or loss of real or personal property resulting from  
8 the conduct of the Administration's functions as speci-  
9 fied in this Act, where such claim is presented to the  
10 Administration in writing within two years after the  
11 accident or incident out of which the claim arises; and

12 (B) if the Administration considers that a claim in  
13 excess of \$5,000 is meritorious and would otherwise be  
14 covered by this paragraph, to report the facts and cir-  
15 cumstances thereof to the Congress for its consideration;  
16 and

17 (13) to reimburse, to the extent determined by the  
18 Administrator or his designee to be fair and reasonable,  
19 the owners and tenants of land and interests in land  
20 hereafter acquired by the United States for use by the  
21 Administration by purchase, condemnation, or otherwise  
22 for expenses and losses and damages incurred by such  
23 owners and tenants as a direct result of moving them-  
24 selves, their families, and their possessions because of  
25 such acquisition. Such reimbursement shall be in addition

1 to, but not in duplication of, any payments that may  
2 otherwise be authorized by law to be made to such  
3 owners and tenants. The total of any such reimbursement  
4 to any owner or tenant shall in no event exceed 25 per  
5 centum of the fair value, as determined by the Admin-  
6 istrator, of the parcel of land or interest in land to which  
7 the reimbursement is related. No payment under this  
8 paragraph shall be made unless application therefor, sup-  
9 ported by an itemized statement of the expenses, losses,  
10 and damages incurred, is submitted to the Administra-  
11 tor within one year from (A) the date upon which the  
12 parcel of land or interest in land is to be vacated under  
13 agreement with the Government by the owner or tenant  
14 or pursuant to law, including but not limited to, an  
15 order of a court, or (B) the date upon which the parcel  
16 of land or interest in the land involved is vacated, which-  
17 ever first occurs. The Administrator may perform any  
18 and all acts and make such rules and regulations as he  
19 deems necessary and proper for the purpose of carrying  
20 out this paragraph. Funds available to the Administra-  
21 tion for the acquisition of real property or interests there-  
22 in shall also be available for carrying out this paragraph.

23 LOAN GUARANTEES

24 SEC. 304. (a) In order to financially assist any person,  
25 firm, association, corporation, or other legal entity in carry-

1 ing out any contract entered into pursuant to paragraph (6)  
2 or (7) of section 303 (a) of this Act, the Administration  
3 may, in accordance with the provisions of this section, guar-  
4 antee to non-Federal lenders making loans to any such per-  
5 son, firm, association, corporation, or entity, payment of prin-  
6 cipal of and interest on loans, made by such lenders, which  
7 are approved under this section.

8 (b) No loan guarantee under this section for any such  
9 purpose referred to in subsection (a) of this section may  
10 apply to so much of the principal amount thereof as exceeds  
11 90 per centum of the cost of carrying out any such purpose.

12 (c) For each project for which a guarantee of a loan is  
13 sought pursuant to this section, there shall be submitted to  
14 the Administration an application by any such person, firm,  
15 association, corporation, or entity seeking such guarantee.  
16 Such application shall contain such information as the Ad-  
17 ministration may require to carry out the purposes of this  
18 section.

19 (d) The Administration may approve such applications  
20 only if—

21 (1) it is assured that the applicant will keep such  
22 records, and afford such access thereto, and make such  
23 reports, in such form and containing such information,  
24 as the Administration may reasonably require; and

25 (2) it determines, in the case of a loan for which

1 a guarantee is sought, that the terms, conditions, matu-  
2 rity, security (if any), and schedule and amount of re-  
3 payments with respect to the loans are sufficient to pro-  
4 tect the financial interests of the United States and are  
5 otherwise reasonable and in accord with regulations, in-  
6 cluding a determination that the rate of interest does not  
7 exceed such per centum per annum on the principal obli-  
8 gation outstanding as the Administration determines to  
9 be reasonable, taking into account the range of interest  
10 rates prevailing in the private market for similar loans  
11 and the risks assumed by the United States.

12 (e) (1) In the case of any such loan guaranteed under  
13 this section, the United States shall be entitled to recover  
14 from the applicant the amount of any payments made pur-  
15 suant to any such guarantee under this section, unless the  
16 Administration for good cause waives its right of recovery,  
17 and, upon making any such payment, the United States shall  
18 be subrogated to all of the rights of the recipient of the pay-  
19 ments with respect to which the guarantee was made.

20 (2) Guarantees of loans under this section shall be sub-  
21 ject to such further terms and conditions as the Administra-  
22 tion determines to be necessary to assure that the purposes of  
23 this section will be achieved, and, to the extent permitted by  
24 subsection (f), any of such terms and conditions may be  
25 modified by the Administration to the extent it determines

1 such modification to be consistent with the financial interest  
2 of the United States.

3 (f) Any guarantee of a loan pursuant to this section  
4 shall be incontestable in the hands of an applicant on whose  
5 behalf such guarantee is made, and as to any person who  
6 makes or contracts to make a loan to such applicant in reli-  
7 ance thereon, except for fraud or misrepresentation on the  
8 part of such applicant or such other person.

9 (g) The cumulative total of the principal of the loans  
10 outstanding at any time with respect to which guarantees  
11 have been issued under this section may not exceed such  
12 limitations as may be specified in appropriations Acts.

13 (h) With respect to any contract or other agreement  
14 entered into pursuant to section 303 (a) (6) involving the  
15 designing, construction, operation, and maintenance of com-  
16 mercial or demonstration type facilities to produce energy  
17 from oil shale, coal gasification, solar power, tidal power, or  
18 other unconventional sources of energy, the Administration  
19 is authorized to include as a part of such contract or agree-  
20 ment provisions pursuant to which the Administration agrees  
21 to purchase any such energy so produced on a cost and  
22 reasonable profit basis. Energy so acquired by the Adminis-  
23 tration shall be disposed of in such manner and under such  
24 terms and conditions as the Administration shall prescribe.  
25 Revenues received by the Administration arising out of the

1 disposition of such energy shall be deposited in the trust fund  
2 established by title II of this Act and shall be available for  
3 use by the Administration in the same manner and to the  
4 same extent as other moneys within such trust fund. Not-  
5 withstanding any other provision of law, no energy product  
6 produced or manufactured by any such facility with respect  
7 to which a loan guarantee was entered into pursuant to this  
8 section shall be exported from the United States for use in  
9 any other country.

10 PATENT POLICY AND MANDATORY LICENSING

11 SEC. 305. (a) (1) All research, development, demon-  
12 stration, or projects contracted for, or financially assisted by  
13 the Administration pursuant to this Act, shall require as a  
14 condition of Federal participation that all information,  
15 whether patented or unpatented, in the form of trade secrets,  
16 know-how, proprietary information, or otherwise, resulting  
17 in whole or in part from federally assisted research shall be  
18 made available at the earliest possible date to the general  
19 public, including, but not limited to, nongovernmental United  
20 States interests capable of bringing about further develop-  
21 ment, utilization, and commercial applications of such re-  
22 sults.

23 (2) The Administrator, in administering patents pur-  
24 suant to this Act, shall make a determination, case by case,  
25 in an on-the-record proceeding conducted in accordance with



1 the provisions of the Administrative Procedure Act, as to  
2 whether patent licenses shall be granted on a royalty-free  
3 basis or upon a basis of charges designed to recover part or  
4 all of the costs of the Federal research. He shall make Gov-  
5 ernment patent rights and technological and scientific know-  
6 how available on nonexclusive and nondiscriminatory terms  
7 to qualified applicants.

8 (3) (A) Whenever a participant in any program, con-  
9 tract, or energy research and development project pursuant  
10 to this Act holds background patents trade secrets, know-  
11 how, or proprietary information which will be employed in  
12 the proposed program, contract, or research and development  
13 project, the Administrator shall enter into an agreement  
14 which will provide equitable protection to the rights of the  
15 public and the participant: *Provided, however,* That any  
16 such agreement shall provide that when the program, con-  
17 tract, or energy research and development project reaches  
18 the stage of possible commercial application, any of the par-  
19 ticipant's previously developed background patents trade  
20 secrets, know-how, or proprietary information reasonably  
21 necessary to possible commercial application of the energy  
22 process or system developed under this title will be made  
23 available to any qualified applicant on reasonable and non-  
24 discriminatory license terms or in other forms which shall  
25 take into account that the commercial viability of the total

1 energy process or system was achieved with the assistance of  
2 public funds.

3 (B) As employed herein, the term "background pat-  
4 ent" means a United States patent owned or pending by a  
5 contractor, grantee, participant, or other party conducting  
6 research or development work, or both, pursuant to this Act  
7 which would be infringed by the practice of any new tech-  
8 nology developed under the research or development work,  
9 or both, contracted for, sponsored or cosponsored pursuant  
10 to this Act, or any demonstration-type or commercial-size  
11 facility federally assisted pursuant to this Act.

12 (b) Whenever the Administration determines that—

13 (1) (A) in the implementation of the requirements  
14 of this Act a right under any United States patent,  
15 which is not otherwise reasonably available, is reason-  
16 ably necessary to the development or demonstration of  
17 an energy system or technology pursuant to this Act,  
18 and

19 (B) there are no reasonably equivalent methods  
20 to accomplish such purpose, and

21 (2) the unavailability of such right may result in a  
22 substantial lessening of competition or tendency to cre-  
23 ate a monopoly in any line of commerce in any section  
24 of the country,

25 the Administration shall so certify to a district court of the

1 United States, which shall review the Administration's  
2 determination. If the district court upholds such determina-  
3 tion, the court shall issue an order requiring the person who  
4 owns such patent, or rights thereunder, to license it on such  
5 reasonable and nondiscriminatory terms and conditions as  
6 the court, after hearing, may determine. Such certification  
7 may be made to the district court for the district court in  
8 which the person owning the patent resides, does business,  
9 or is found.

10 (c) The Administration shall, in determining license  
11 terms, duly consider and give weight to the effects of such  
12 terms on competition and small business.

13 (d) Nothing in this section shall be deemed to convey  
14 to any individual, corporation, or other business organization  
15 immunity from civil or criminal liability, or to create de-  
16 fenses to actions, under the antitrust laws.

17 (e) As used in this section, the term "antitrust laws"  
18 means—

19 (1) the Act entitled "An Act to protect trade and  
20 commerce against unlawful restraints and monopolies",  
21 approved July 2, 1890 (15 U.S.C. 1 et seq.), as  
22 amended;

23 (2) the Act entitled "An Act to supplement exist-  
24 ing laws against unlawful restraints and monopolies, and

for other purposes”, approved October 15, 1914 (15 U.S.C. 12 et seq.), as amended;

(3) the Federal Trade Commission Act (15 U.S.C. 41 et seq.), as amended;

(4) sections 73 and 74 of the Act entitled “An Act to reduce taxation, to provide revenue for the Government, and for other purposes”, approved August 27, 1894 (15 U.S.C. 8 and 9), as amended; and

(5) the Act of June 19, 1936, chapter 592 (15 U.S.C. 13, 13a, 13b, and 21a).

#### MONETARY AWARDS

SEC. 306. (a) Subject to the provisions of this section, the Administrator is authorized, upon his own initiative or upon the application of any individual, partnership, corporation, association, institution, or other entity, to make a monetary award, in such amount and upon such terms as he shall determine to be warranted, to any such individual, partnership, corporation, association, institution, or other entity, for any scientific or technical contribution to the Administration which is determined by the Administrator to have significant value in the conduct of energy activities. In determining the terms and conditions of any award the Administrator shall take into account—

(1) the value of the contribution to the United States;

1           (2) the aggregate amount of any sums which have  
2       been expended by the applicant for the development of  
3       such contribution;

4           (3) the amount of any compensation (other than  
5       salary received for services rendered as an officer or  
6       employee of the Government) previously received by  
7       the applicant for or on account of the use of such  
8       contribution by the United States; and

9           (4) such other factors as the Administrator shall  
10      determine to be material.

11          (b) If more than one applicant under subsection (a) of  
12      this section claims an interest in the same contribution, the  
13      Administrator shall ascertain and determine the respective  
14      interests of such applicants, and shall apportion any award to  
15      be made with respect to such contribution among such appli-  
16      cants in such proportions as he shall determine to be equi-  
17      table. No award may be made under subsection (a) of this  
18      section with respect to any contribution—

19           (1) unless the applicant surrenders, by such means  
20      as the Administrator shall determine to be effective,  
21      all claims which such applicant may have to receive any  
22      compensation (other than the award made under this  
23      section) for the use of such contribution or any element  
24      thereof at any time by or on behalf of the United States,  
25      or by or on behalf of any foreign government pursuant

1 to any treaty or agreement with the United States,  
2 within the United States or at any other place; or

3 (2) in any amount exceeding \$100,000, unless the  
4 Administrator has transmitted to the appropriate com-  
5 mittees of the Congress a full and complete report con-  
6 cerning the amount and terms of, and the basis for,  
7 such proposed award, and thirty calendar days of regu-  
8 lar session of the Congress have expired after receipt of  
9 such report by such committees.

#### 10 AMENDMENTS

11 SEC. 307. (a) Section 5313 of title 5, United States  
12 Code, is amended by adding at the end thereof the following:

13 “(22) Administrator of the Federal Energy Ad-  
14 ministration.”.

15 (b) Section 5314 of title 5, United States Code, is  
16 amended by adding at the end thereof the following:

17 “(60) Deputy Administrator of the Federal Energy  
18 Administration.”.

#### 19 AUTHORIZATION

20 SEC. 308. (a) There are authorized to be appropriated  
21 out of the Energy Trust Fund (established by title II of  
22 this Act) such sums as may be necessary to carry out this  
23 Act. Sums appropriated pursuant to this section shall remain  
24 available until expended.

25 (b) Any funds appropriated for the construction of

1 facilities may be used for emergency repairs of existing  
2 facilities when such existing facilities are made inoperative  
3 by major breakdown, accident, or other circumstances and  
4 such repairs are deemed by the Administrator to be of greater  
5 urgency than the construction of new facilities.

#### 6 REPORTS

7 SEC. 309. (a) The Administration shall submit to the  
8 President for transmittal to the Congress in January of each  
9 year a report, which shall include (1) a comprehensive de-  
10 scription of the programed activities and accomplishments  
11 of the Administration in the field of energy activity during  
12 the preceding calendar year, and (2) an evaluation of such  
13 activities and accomplishments in terms of the attainment  
14 of, or the failure to attain, the objectives and purposes of  
15 this Act.

16 (b) Any report made under this section shall contain  
17 such recommendations for additional legislation as the Admin-  
18 istrator or the President may consider necessary or desir-  
19 able for the attainment of the objectives and purposes of  
20 this Act.

#### 21 TRANSFER OF FUNCTIONS

22 SEC. 310. (a) There are hereby transferred to the  
23 Administration, all functions (including powers, duties, ac-  
24 tivities, facilities, and parts of functions) which were carried  
25 out immediately before the effective date of this section, by

1 the Atomic Energy Commission and which relate primarily  
2 to the peaceful uses of atomic energy.

3 (b) With respect to any function transferred by this  
4 section and exercised after the effective date of this section,  
5 reference in any other Federal law, rule, or regulation to  
6 the Atomic Energy Commission shall, to the extent of the  
7 functions so transferred, be deemed to mean the Administra-  
8 tion.

9 (c) In the exercise of any such function so transferred,  
10 the Administration shall have the same authority as that  
11 vested in the Atomic Energy Commission immediately prior  
12 to its transfer and the actions of the Administration, in exer-  
13 cising such function, shall have the same force and effect  
14 as when exercised by the Atomic Energy Commission im-  
15 mediately prior to its transfer by this section.

16 (d) All personnel, assets, liabilities, property, and rec-  
17 ords as are determined by the Director of the Office of Man-  
18 agement and Budget to be employed, held, or used primarily  
19 in connection with any function transferred by this section  
20 are hereby transferred to the Administration in such manner  
21 and to such extent as the said Director shall prescribe. Such  
22 personnel shall be transferred in accordance with applicable  
23 laws and regulations relating to the transfer of functions.

24 FUTURE TRANSFER OF FUNCTIONS

25 SEC. 311. (a) Subject to the provisions of this section,



1 the President, for a period of thirty-six calendar months fol-  
2 lowing the effective date of this section, may transfer to the  
3 Administration any functions (including powers, duties,  
4 activities, facilities, and parts of functions) of any other  
5 department or agency of the United States, or of any officer  
6 or organizational entity thereof, which relate primarily to the  
7 functions, powers, and duties of the Administration as pre-  
8 scribed by this Act. In connection with any such transfer,  
9 the President may, under this section or other applicable au-  
10 thority, provide for appropriate transfers of records, prop-  
11 erty, personnel, and funds.

12 (b) No transfer shall be made under this section or any  
13 other law until (1) a full and complete report concerning  
14 the nature and effect of such proposed transfer has been  
15 transmitted by the President to the Congress, and (2) the  
16 first period of sixty calendar days of regular session of the  
17 Congress following the date of receipt of such report by the  
18 Congress has expired without the adoption by the Congress  
19 of a concurrent resolution stating that the Congress does not  
20 favor such transfer.

#### 21 TITLE IV—COMMISSION ON ENERGY

##### 22 TECHNOLOGY ASSESSMENT

##### 23 ESTABLISHMENT OF COMMISSION

24 SEC. 401. (a) There is hereby established the Com-  
25 mission on Energy Technology Assessment (hereinafter re-

1 ferred to in this section as the "Commission"), which shall be  
2 independent of the executive departments.

3 (b) The Commission shall consist of an Energy Tech-  
4 nology Assessment Board (hereinafter referred to in this  
5 section as the "Board") which shall formulate and promul-  
6 gate the policies of the Commission, and a Commissioner  
7 who shall carry out such policies and administer the opera-  
8 tions of the Commission. The Commissioner shall be ap-  
9 pointed by the President of the United States, with the ad-  
10 vice and consent of the Senate.

11 (c) The Board shall consist of twenty-two members as  
12 follows:

13 (1) seven members appointed by the President of  
14 the United States, with the advice and consent of the  
15 Senate, who shall be persons eminent in one or more  
16 fields of the physical, biological, or social sciences;

17 (2) seven members appointed by the President of  
18 the United States, with the advice and consent of the  
19 Senate, who shall be persons eminent in the field of  
20 engineering;

21 (3) seven members appointed by the President of  
22 the United States, with the advice and consent of the  
23 Senate, who shall be persons eminent in the field of  
24 economics; and

1           (4) the Commissioner, who shall not be a voting  
2       member.

3           (d) Members of the Board, including the Commis-  
4       sioner, shall receive basic pay at the rate provided for  
5       level II of the Executive Schedule under section 5314 of  
6       title 5, United States Code.

7           (e) The Commissioner shall be appointed for a term  
8       of ten years. Members of the Board shall be appointed for  
9       terms of ten years, except that, of the members first ap-  
10      pointed (other than the Commissioner), seven shall be  
11      appointed for terms of four years, seven for terms of seven  
12      years, and seven for terms of ten years. Vacancies in the  
13      membership of the Board shall not affect the power of the  
14      remaining members to execute the functions of the Board  
15      and shall be filled in the same manner as in the case of  
16      the original appointment.

17          (f) The Commissioner shall serve as Chairman of the  
18      Board. The Deputy Commissioner shall act in the place and  
19      stead of the Chairman in the absence of the Chairman.

20          (g) (1) The basic functions of the Commission shall  
21      be—

22            (A) to advise, consult with, and make recommen-  
23      dations to, the Administration;

24            (B) to provide early indications of the probable  
25      beneficial and adverse impacts of the applications of  
26      technology related to energy;

1           (C) to analyze the quality of research, develop-  
2           ment, and demonstration contracted for by the Admin-  
3           tration in carrying out the purposes of this Act, and  
4           the Commission is authorized to enter into contracts  
5           with individuals, private agencies and entities, educa-  
6           tional institutions, and other nongovernmental sources  
7           in making such analysis;

8           (D) to establish standards and goals for research,  
9           development, and demonstration on a priority basis in  
10          accordance with the present and future energy needs  
11          of the United States;

12          (E) to engage in studies to evaluate the relative  
13          benefits and costs of alternative forms of energy; and

14          (F) to construct and maintain economic models of  
15          the energy needs of the United States economy and the  
16          alternative means and costs of satisfying such needs cur-  
17          rently and during the subsequent five years.

18          (2) In carrying out such functions, the Commission  
19          shall—

20                (A) identify existing or probable impacts of tech-  
21                nology or technological programs relating to energy;

22                (B) where possible, ascertain cause-and-effect rela-  
23                tionships;

24                (C) identify alternative technological methods of  
25                implementing specific programs relating to energy;

1           (D) identify alternative programs for achieving req-  
2       uisite goals;

3           (E) make estimates and comparisons of the impacts  
4       of alternative methods and programs relating to energy;

5           (F) estimate the economic costs of alternative  
6       energy sources and programs when technological devel-  
7       opment has been completed;

8           (G) identify the availability of various forms of  
9       energy from domestic and foreign sources and their pros-  
10      pects as reliable continuous sources of supply in the  
11      future;

12          (H) present findings of completed analyses to the  
13      Administration, to the appropriate committees of the  
14      Congress, and to the public;

15          (I) identify areas where additional research or data  
16      collection is required to provide adequate support for  
17      the assessments and estimates described in subparagraphs  
18      (A) through (H) of this paragraph;

19          (J) from time to time, take such action as may be  
20      necessary to keep the public fully informed as to its  
21      findings and recommendations in connection with the  
22      carrying out of such functions; and

23          (K) undertake such additional associated activities  
24      as the Commission may determine necessary, or that the  
25      Administration may request.

1       (h) The Board is authorized to sit and act at such places  
2 and times as it may determine, and upon a vote of a majority  
3 of its members, to require by subpoena or otherwise the at-  
4 tendance of such witnesses and the production of such books,  
5 papers, and documents, to administer such oaths and affirma-  
6 tions, to take such testimony, to procure such printing and  
7 binding, and to make such expenditures, as it deems advis-  
8 able. The Board may make such rules respecting its organiza-  
9 tion and procedures as it deems necessary, except that no  
10 recommendation shall be reported from the Board unless a  
11 majority of the Board assent. Subpenas may be issued over  
12 the signature of the Chairman of the Board or of any voting  
13 member designated by him or by the Board, and may be  
14 served by such person or persons as may be designated by  
15 such Chairman or member. The Chairman of the Board or  
16 any voting member thereof may administer oaths or affirma-  
17 tions to witnesses.

18       (i) In addition to the powers and duties vested in him  
19 by this section, the Commissioner shall exercise such powers  
20 and duties as may be delegated to him by the Board.

21       (j) The Commissioner may appoint, with the approval  
22 of the Board, a Deputy Commissioner who shall perform  
23 such functions as the Commissioner may prescribe and who  
24 shall be Acting Commissioner during the absence or in-  
25 capacity of the Commissioner or in the event of a vacancy in

1 the office of Commissioner. The Deputy Commissioner shall  
2 receive basic pay at the rate provided for level IV of the  
3 Executive Schedule under section 5315 of title 5.

4 (k) The Commission shall have the authority, within  
5 the limits of available appropriations, to do all things nec-  
6 essary to carry out the provisions of this section, including,  
7 but without being limited to, the authority to—

8 (1) make full use of competent personnel and or-  
9 ganizations outside the Commission, public or private,  
10 and form special ad hoc task forces or make other  
11 arrangements when appropriate;

12 (2) enter into contracts or other arrangements as  
13 may be necessary for the conduct of the work of the  
14 Commission with any agency or instrumentality of the  
15 United States, with any State, territory, or possession or  
16 any political subdivision thereof, or with any person,  
17 firm, association, corporation, or educational institution,  
18 with or without reimbursement, without performance or  
19 other bonds, and without regard to section 5 of title 41;

20 (3) make advance, progress, and other payments  
21 which relate to technology assessment in the energy field  
22 without regard to the provisions of section 529 of title 31;

23 (4) accept and utilize the services of voluntary and  
24 uncompensated personnel necessary for the conduct of  
25 the work of the Commission and provide transportation

1 and subsistence as authorized by section 5703 of title  
2 5 for persons serving without compensation;

3 (5) acquire by purchase, lease, loan, or gift, and  
4 hold and dispose of by sale, lease, or loan, real and per-  
5 sonal property of all kinds necessary for or resulting from  
6 the exercise of authority granted by this section; and

7 (6) prescribe such rules and regulations as it deems  
8 necessary governing the operation and organization of  
9 the Commission.

10 (l) Contractors and other parties entering into con-  
11 tracts and other arrangements under this section which  
12 involve costs to the Government shall maintain such books  
13 and related records as will facilitate an effective audit in such  
14 detail and in such manner as shall be prescribed by the  
15 Office, and such books and records (and related documents  
16 and papers) shall be available to the Office and the Comp-  
17 troller General of the United States, or any of their duly  
18 authorized representatives, for the purpose of audit and  
19 examination.

20 (m) The Commission, in carrying out the provisions of  
21 this chapter, shall not, itself, operate any laboratories, pilot  
22 plants, or test facilities.

23 (n) The Commission is authorized to secure directly  
24 from any executive department or agency information, sug-



1 gestions, estimates, statistics, and technical assistance for the  
2 purpose of carrying out its functions under this section.  
3 Each such executive department or agency shall furnish  
4 the information, suggestions, estimates, statistics, and tech-  
5 nical assistance directly to the Commission upon its request.

6 (o) On request of the Commission, the head of any  
7 executive department or agency may detail, with or without  
8 reimbursement, any of its personnel to assist the Commission  
9 in carrying out its functions under this section.

10 (p) The Commissioner shall, in accordance with such  
11 policies as the Board shall prescribe, appoint and fix the  
12 compensation of such personnel as may be necessary to carry  
13 out the provisions of this section, and obtain services of  
14 experts and consultants in accordance with section 3109 of  
15 title 5, United States Code.

16 (q) The Commission shall submit to the Congress an  
17 annual report setting forth actions taken by it during the  
18 calendar year preceding such report in carrying out its func-  
19 tions under this section, including its expenses with respect  
20 thereto. Such report shall be submitted not later than March  
21 15 of each year and shall be available to the public.

22 (r) For the fiscal year ending June 30, 1975, there is  
23 authorized to be appropriated such sum, not to exceed  
24 \$ \_\_\_\_\_, as may be necessary to enable the Commis-  
25 sion to carry out its functions under this section. To enable

1 the Commission to carry out its functions each fiscal year  
2 thereafter, there is authorized to be appropriated out of  
3 moneys in the trust fund established pursuant to title II of  
4 this Act an amount equal to 1 per centum of moneys re-  
5 ceived by such fund during the preceding fiscal year.

6 **TITLE V—TERMINATION OF PRICE CONTROLS**  
7 **PETROLEUM PRODUCTS, CRUDE OIL, NATURAL GAS, COAL,**  
8 **AND DRILLING AND MINING EQUIPMENT**

9 **SEC. 501.** Section 203 of the Economic Stabilization Act  
10 is amended by adding at the end thereof the following new  
11 subsections:

12 “(k) Upon the expiration of one year following the date  
13 of enactment of this subsection, or on the date provided in  
14 section 218, whichever is earlier, the authority conferred by  
15 this section to stabilize the prices of petroleum products,  
16 crude oil, natural gas, and coal shall terminate, but such  
17 termination of authority shall not affect any action or pend-  
18 ing proceedings, civil or criminal, not finally determined on  
19 the date of such termination of authority, nor any action or  
20 proceeding based upon any act committed prior to such date.  
21 Immediately upon the enactment of this subsection, the Pres-  
22 ident or his delegate shall begin to make such periodic ad-  
23 justments in ceiling prices of commodities referred to in the  
24 preceding sentence as may be appropriate to insure that such  
25 termination of authority may be accomplished in a manner

1 which does not cause undue disruption or dislocation in the  
2 economy or any industry.

3 “(1) Notwithstanding the provisions of section 218, the  
4 authority conferred by this section may not be exercised  
5 after the date of the enactment of this subsection to stabilize  
6 the prices of steel pipe, drilling equipment, casing, or any  
7 other steel product which the Secretary of the Interior certi-  
8 fies is in short supply in the United States and is used in the  
9 extraction, refining, or transportation of crude oil or gas, or  
10 in the extraction of coal, but the provisions of this subsection  
11 do not affect any action or pending proceedings, civil or  
12 criminal, not finally determined on such date, nor any action  
13 or proceeding based upon any act committed prior to such  
14 date.”.

15 NATURAL GAS DEREGULATION

16 SEC. 502. (a) Section 1 (b) of the Natural Gas Act is  
17 amended to read as follows:

18 “(b) The provisions of this Act shall apply to the trans-  
19 portation of natural gas in interstate commerce, to the sale  
20 in interstate commerce of natural gas for domestic, commer-  
21 cial, industrial, or any other use, and to natural gas com-  
22 panies engaged in such transportation or sale, but shall not  
23 apply to any other transportation or sale of natural gas or  
24 to the local distribution of natural gas or to the facilities used  
25 for such distribution or to the production or gathering of nat-

1 ural gas or to the sale of natural gas dedicated for the first  
2 time to interstate commerce or rededicated upon expiration  
3 of an existing contract on or after the date of the enactment  
4 of the Energy Revenue and Development Act of 1973, or  
5 produced from wells commenced on or after such date, for  
6 domestic, commercial, industrial, or any other use, by any  
7 person, whose principal business is not the transportation of  
8 natural gas in interstate commerce.”

9 (b) Section 2 (6) of the Natural Gas Act is amended by  
10 striking the last two words and by inserting before the pe-  
11 riod at the end thereof a comma and the following: “subject  
12 to the exception in section 1 (b) above”.

13 (c) Section 2 of the Natural Gas Act is amended by  
14 adding at the end thereof the following new clause:

15 “(10) ‘Affiliate’ of another person means any per-  
16 son directly or indirectly controlling, controlled by, or  
17 under common control with such other person.”

18 (d) Section 3 of the Natural Gas Act is amended by  
19 striking from the first sentence “or import any natural gas  
20 from a foreign country” and by striking from the second sen-  
21 tence “or importation”.

22 (e) Section 4 (e) of the Natural Gas Act is amended by  
23 inserting before the period at the end thereof a colon and the  
24 following: “*Provided, however,* That the Commission shall

1 have no power to deny, in whole or in part, that portion of  
2 the rates and charges made, demanded, or received by any  
3 natural gas company for or in connection with the purchase  
4 of natural gas exempt from this Act pursuant to section 1 (b)  
5 except to the extent that the rates or charges made, de-  
6 manded, or received for natural gas by an affiliate of the pur-  
7 chasing natural gas company exceed those made, demanded,  
8 or received by persons not affiliated with the purchasing  
9 natural gas company: *Provided further*, That the Commis-  
10 sion shall have no power to deny, in whole or in part, that  
11 portion of the rates or charges made, demanded, or received  
12 by any natural gas company for natural gas produced from  
13 the properties of that company from wells commenced on or  
14 after the date of the enactment of the Energy Revenue and  
15 Development Act of 1973, except to the extent that the  
16 rates or charges made, demanded, or received exceed those  
17 made, demanded, or received for natural gas by persons not  
18 affiliated with the purchasing natural gas company.”.

19 (f) Section 5 (a) of the Natural Gas Act is amended by  
20 inserting before the period at the end thereof a colon and the  
21 following: “*Provided, however*, That the Commission shall  
22 have no power to deny, in whole or in part, that portion of  
23 the rates and charges made, demanded, or received by any  
24 natural gas company for or in connection with the purchase

1 of natural gas exempt from this Act pursuant to section 1 (b).  
2 except to the extent that the rates or charges made, de-  
3 manded, or received for natural gas by an affiliate of the pur-  
4 chasing natural gas company exceed those made, demanded,  
5 or received by persons not affiliate with the purchasing nat-  
6 ural gas company: *And provided further*, That the Commis-  
7 sion shall have power to deny, in whole or in part, that por-  
8 tion of the rates or charges made, demanded, or received by  
9 any natural gas company for natural gas produced from the  
10 properties of that company from wells commenced on or af-  
11 ter the date of the enactment of the Energy Revenue and  
12 Development Act of 1973, except to the extent that the  
13 rates or charges made, demanded, or received exceed those  
14 made, demanded, or received from natural gas by persons  
15 not affiliated with the purchasing natural gas company: *And*  
16 *provided further*, That the Commission shall have no power  
17 to order a decrease in the rate or charge made, demanded, or  
18 received for the sale of natural gas by any person not en-  
19 gaged in the transportation of natural gas in interstate com-  
20 merce or by any affiliate of such person, if such rate or charge  
21 shall have been previously determined to be just and reason-  
22 able, such determination being final and no longer subject  
23 to judicial review.”.



1 portation, and sale of consumable energy, or of fuel for con-  
2 version into consumable energy.

3 “(c) REINVESTMENT OF PROFITS FROM ENERGY  
4 SOURCES.—

5 “(1) INVESTMENT REQUIRED.—Profits from en-  
6 ergy sources in excess of the profit allowance provided  
7 in subsection (d) must be invested in qualified energy  
8 projects by the end of the taxable year following the  
9 taxable year during which such profits were earned.  
10 An investment is made when—

11 “(A) the taxpayer makes an outlay with re-  
12 spect to a qualified energy project, or

13 “(B) enters into a contract under which he is  
14 obligated to make the outlay within a 2-year period  
15 beginning on the effective date of the contract.

16 “(2) QUALIFIED ENERGY PROJECT.—To qualify  
17 under this subsection, an energy project must further the  
18 expansion or improvement of existing energy sources, or  
19 must further the exploration for, research on, or develop-  
20 ment of new energy sources, which—

21 “(A) are located within the United States or  
22 its possessions (within the meaning of section 638),  
23 and

24 “(B) have been determined by the Adminis-  
25 trator of the Federal Energy Administration mate-



1 rially to assist in the development of the domestic  
2 energy resources of the United States.

3 Determinations by the Administrator under this para-  
4 graph may describe projects by their general characteris-  
5 tics and location and shall be published in the Federal  
6 Register.

7 “(3) ADMINISTRATIVE ACTIONS.—Within 6  
8 months after the date of enactment of this chapter, and  
9 as frequently thereafter as may be necessary—

10 “(A) the Secretary or his delegate shall pre-  
11 scribe such regulations as he may deem necessary  
12 to specify the outlays which will meet the invest-  
13 ment requirements of paragraph (1), and

14 “(B) the Administrator shall publish determi-  
15 nations of qualified energy projects which meet the  
16 requirements of paragraph (2).

17 “(d) PROFIT ALLOWANCE.—The profit of any person  
18 from energy sources for the taxable year shall be reduced  
19 by—

20 “(1) 20 percent of his average net investment for  
21 the taxable year in energy sources (determined under  
22 section 4962) for the taxable year, or

23 “(2) \$100,000,

24 whichever is greater.

1 **“SEC. 4961. DETERMINATION OF TAX BASE.**

2 “(a) **PROFIT FROM ENERGY SOURCES.**—The profit  
3 from energy sources shall equal the sum of—

4 “(1) the taxable income derived by the taxpayer  
5 from energy property (as defined in section 4962 (d) ),  
6 computed with the modifications specified in subsection  
7 (b), plus

8 “(2) gain realized from the sale or exchange of  
9 energy property.

10 In the case of oil and gas wells and other mineral interests,  
11 for purposes of this chapter, the term ‘taxable income from  
12 energy sources’ has the same meaning as the term ‘taxable  
13 income from the property’ has for purposes of section 613.

14 “(b) **MODIFICATIONS.**—The modifications referred to  
15 in subsection (a) are as follows:

16 “(1) **QUALIFIED INVESTMENTS.**—A deduction or  
17 capital loss shall not be allowed with respect to an out-  
18 lay—

19 “(A) treated by the taxpayer as a qualified in-  
20 vestment under section 4960 (c), or

21 “(B) attributable to an outlay which, in a  
22 prior taxable year, was treated by the taxpayer as  
23 a qualified investment under section 4960 (c),  
24 of profits from energy sources for any taxable year to  
25 which section 4960 applied.

1           “(2) CAPITAL GAINS AND LOSSES OF TAXPAYERS  
2 OTHER THAN CORPORATIONS.—In the case of a taxpayer  
3 other than a corporation—

4           “(A) the amount deductible on account of  
5 losses from sales or exchanges of energy properties  
6 which are capital assets shall not exceed the amount  
7 includible on account of gains from sales or ex-  
8 changes of such properties; and

9           “(B) the deduction provided by section 1202  
10 for long-term capital gains from the sale or ex-  
11 change of energy property shall not be allowed.

12           “(3) ACCELERATED DEPRECIATION.—

13           “(A) LIMITED DEDUCTION ALLOWED.—In the  
14 case of energy property which is subject to the al-  
15 lowance for depreciation, the deduction allowable  
16 for the taxable year for exhaustion, wear and tear,  
17 obsolescence, or amortization shall not be allowed to  
18 the extent that such deduction exceeds the deprecia-  
19 tion deduction which would have been allowable for  
20 the taxable year had the taxpayer depreciated the  
21 property under the straight-line method for each  
22 taxable year of its useful life for which the taxpayer  
23 has held the property.

24           “(B) RECAPTURED DEPRECIATION.—To the  
25 extent that any deductions for depreciation have

1           been disallowed under subparagraph (A) with re-  
 2           spect to section 1245 or section 1250 property, gain  
 3           taxable under section 1245 or section 1250, as the  
 4           case may be, shall be appropriately reduced.

5           “(4) DEDUCTIONS FOR INCOME TAXES.—A deduc-  
 6           tion shall be allowed for that portion of the taxes im-  
 7           posed by chapter 1 for the taxable year, reduced by the  
 8           sum of the credits allowable under—

9                 “(A) section 37 (relating to retirement in-  
 10                 come),

11                 “(B) section 38 (relating to investment  
 12                 credit),

13                 “(C) section 40 (relating to expenses of work  
 14                 incentive program), and

15                 “(D) section 41 (relating to contributions to  
 16                 candidates for public office),

17           which are attributable to profits from energy sources.

18           “(c) WITHDRAWAL OF INVESTMENT.—

19                 “(1) INCREASE IN PROFITS CAUSED BY WITH-  
 20                 DRAWAL.—If energy property with respect to which a  
 21                 a qualified investment was made during a taxable year  
 22                 to which section 4960 applies is disposed of, or is de-  
 23                 voted to a nonqualifying use, the profits from energy  
 24                 sources shall be increased by an amount equal to the  
 25                 difference between the greater of—

1           “(A) the amount treated as a qualified invest-  
2           ment with respect to such property, or

3           “(B) (i) in the case of a sale, exchange, or  
4           involuntary conversion, the amount realized, or

5           “(ii) in the case of any other disposition, or a  
6           nonqualifying use, the fair market value of such  
7           property, and

8           the recognized gain, if any, resulting from the disposition  
9           of such property.

10           “(2) NONQUALIFYING USE.—A use of energy  
11           property is a nonqualifying use if the property as so used  
12           would not meet the requirements of section 4960 (c) for  
13           purposes of a direct investment of energy profits.

14           “(3) EXCEPTIONS.—Paragraph (1) shall not ap-  
15           ply to—

16           “(A) a disposition by gift;

17           “(B) a transfer at death, except as provided  
18           in section 691 (relating to income in respect of a  
19           decedent) ;

20           “(C) a transfer in which the basis of property  
21           in the hands of a transferee is determined by refer-  
22           ence to its basis in the hands of the transferor by  
23           reason of the application of section 332, 351, 361,  
24           371 (a), 374 (a), 721, or 731, except as provided  
25           below; and

1           “(D) a disposition in which gain is not recog-  
2           nized in whole or in part under section 1031 or 1033,  
3           except as provided below.

4           In dispositions to which subparagraphs (C) and (D)  
5           apply, paragraph (1) shall apply only to the extent  
6           that (i) the sum of the value of property which does  
7           not qualify to be received without recognition of gain  
8           and the amount of money which is received by the  
9           taxpayer in the disposition, exceeds (ii) the gain  
10          recognized.

11   **“SEC. 4962. NET INVESTMENT IN ENERGY SOURCES.**

12          “(a) **IN GENERAL.**—For purposes of this chapter, the  
13          term ‘net investment in energy sources’ means the average  
14          amount for the taxable year of that portion of the adjusted  
15          basis of energy property which is attributable to the equity  
16          interest of the taxpayer.

17          “(b) **EQUITY INTEREST.**—The equity interest of the  
18          taxpayer in energy property shall be determined by taking  
19          into account indebtedness incurred or continued by him which  
20          is directly related—

21                 “(1) to the production of profits from energy  
22                 sources, or

23                 “(2) to the interest of the taxpayer in a partner-  
24                 ship, trust, or corporation which is primarily engaged in  
25                 the production of profits from energy sources.

1 In the case of a partnership, to the extent that indebtedness  
 2 incurred or continued by the partnership results in adjust-  
 3 ments to the basis of the interest of the taxpayer in the part-  
 4 nership under section 752 (relating to the effect of partner-  
 5 ship liabilities), the indebtedness of the partnership shall be  
 6 treated as indebtedness incurred or continued by the  
 7 taxpayer.

8 “(c) REINVESTMENT.—No increase in net investment  
 9 shall be allowed for purchases by the taxpayer of energy  
 10 property if a sale of other energy property was made by the  
 11 taxpayer within a period beginning 6 months before the  
 12 purchase and ending 6 months after the purchase, unless  
 13 the sale and purchase results in—

14 “(1) a material change in the kind of energy prop-  
 15 erty held or used by the taxpayer, or

16 “(2) an increase in the amount of such property.

17 If no material change in the kind of property results from  
 18 the sale and purchase, an increase in basis allowed under  
 19 paragraph (2) shall be limited to the increase in the amount  
 20 of energy property held or used by the taxpayer.

21 “(d) ENERGY PROPERTY.—For purposes of this chap-  
 22 ter, ‘energy property’ means property, or an interest in  
 23 property—

24 “(1) held by the taxpayer for, or

25 “(2) used by the taxpayer directly in,

1 the production of profits from energy sources. The term in-  
 2 cludes an interest in a partnership, trust, or corporation only  
 3 if such partnership, trust, or corporation is primarily engaged  
 4 in the production of profits from energy sources.

5 “(e) REGULATIONS.—The Secretary or his delegate shall  
 6 prescribe such regulations as he may deem necessary to de-  
 7 termine the net investment of the taxpayer in energy sources  
 8 by applying the rules provided in this section.”.

9 (b) CLERICAL AMENDMENT.—The table of chapters  
 10 for such subtitle D is amended by adding at the end thereof  
 11 the following new item:

“CHAPTER 43. Uninvested profits from energy sources.”.

12 (c) EFFECTIVE DATE.—The amendment made by sub-  
 13 section (a) shall apply to taxable years beginning after the  
 14 date of the enactment of this Act.

15 TITLE VII—IMPORTS OF PETROLEUM AND PE-  
 16 TROLEUM PRODUCTS, NATURAL GAS, AND  
 17 CERTAIN DRILLING AND MINING EQUIP-  
 18 MENT

19 VARIABLE IMPORT DUTIES

20 SEC. 701. (a) The headnotes for schedule 4, part 10,  
 21 of the Tariff Schedules of the United States are amended  
 22 by adding at the end thereof the following new headnote:

23 “4. (a) The duty imposed by this headnote is, with re-  
 24 spect to any article described in this part—



1           “(1) the amount by which the domestic price of  
2           similar domestic articles in effect for the month in which  
3           such article is imported (as determined and prescribed  
4           under subsection (b) ), exceeds

5           “(2) the price (or value) of the article (including  
6           any duty imposed by this part, other than this headnote)  
7           on the date and at the place of importation.

8           “(b) The Secretary of the Treasury shall, at the end of  
9           each month, determine the average price at which each of the  
10          articles described in this part which was extracted or pro-  
11          duced in the United States was sold during such month in  
12          the United States. The average price so determined for each  
13          article shall, for purposes of subsection (a) (1), be pre-  
14          scribed by the Secretary of the Treasury as the domestic  
15          price of such article in effect for the following month.”

16          (b) (1) The rates of duty in rate columns numbered 1  
17          and 2 for all items in schedule 4, part 10, of the Tariff  
18          Schedules of the United States (other than for items 475.15  
19          and 475.70) are each amended by adding at the end thereof  
20          “+ the duty (if any) imposed by headnote 4”.

21          (2) The rates of duty in rate columns numbered 1  
22          and 2 for items 475.15 and 475.70 of such schedules are  
23          each amended by adding at the end thereof “, except for the  
24          duty (if any) imposed by headnote 4”.

25          (c) The amendments made by this section shall apply

1 with respect to articles entered, or withdrawn from ware-  
2 house, for consumption on or after the first day of the first  
3 month which begins more than thirty days after the date of  
4 the enactment of this Act.

5           **IMPORTS FROM CERTAIN ARAB COUNTRIES**

6           **SEC. 702.** (a) The total quantity of the articles de-  
7 scribed in schedule 4, part 10, of the Tariff Schedules of the  
8 United States which may be imported into the United States  
9 during the calendar year 1974 and each subsequent calendar  
10 year from the countries enumerated in subsection (b) shall  
11 not exceed 5 percent of the estimated United States con-  
12 sumption of such articles for such year.

13           (b) The countries to which this section applies are  
14 Saudi Arabia, Libya, Algeria, United Arab Emirates, Ku-  
15 wait, Egypt, Oman, Iraq, Syria, Qatar, and Bahrain.

16           (c) The Secretary of the Interior (hereafter in this sec-  
17 tion referred to as the "Secretary") shall before the begin-  
18 ning of each calendar year estimate the United States con-  
19 sumption of the articles described in schedule 4, part 10,  
20 of the Tariff Schedules of the United States for such calendar  
21 year. The Secretary may, from time to time during any  
22 calendar year, revise his estimate of United States consump-  
23 tion of such articles for such year. The Secretary shall pub-  
24 lish his estimate for each calendar year and any revised esti-  
25 mate for such year in the Federal Register.

1           (d) The President shall by proclamation limit the total  
2 quantity of articles described in schedule 4, part 10, of the  
3 Tariff Schedules of the United States which may be entered,  
4 or withdrawn from warehouse, for consumption from the  
5 countries enumerated in subsection (b) during each calendar  
6 year to the quantity prescribed for such year under subsec-  
7 tion (a), based upon the estimates, or revised estimates,  
8 made by the Secretary for such year under subsection (c).  
9 In any case in which any revised estimate results in a quan-  
10 tity of such articles which may be imported into the United  
11 States during a calendar year which is lower than the quan-  
12 tity resulting from the original estimate or a previous revised  
13 estimate for such year, the total quantity of such articles  
14 which may be imported during such year shall not be less  
15 than the quantity actually imported on or before the date on  
16 which the Secretary publishes such revised estimate.

17           (e) The Secretary shall issue licenses for the importa-  
18 tion into the United States of articles the importation of  
19 which is limited by a proclamation of the President under  
20 subsection (d). The Secretary shall publicly announce the  
21 time, manner, and place for the submission of bids for the  
22 purchase of licenses to import specified quantities of such ar-  
23 ticles from the countries enumerated in subsection (b). Each  
24 license shall be issued under this subsection to the highest  
25 responsible bidder unless the Secretary determines that no

1 bid is sufficiently high or that there has been collusion among  
2 bidders. In issuing licenses under this subsection, the Secre-  
3 tary shall endeavor to assure, to the maximum extent possi-  
4 ble, adequate supplies in Puerto Rico of the articles described  
5 in schedule 4, part 10, of the Tariff Schedules of the United  
6 States.

7 (f) The President may suspend any proclamation made  
8 under subsection (d), or increase the total quantity proclaimed  
9 under such subsection, if he determines and proclaims that  
10 such action is required by overriding economic or national  
11 security interests of the United States, giving special weight  
12 to the importance to the Nation of the economic well-being  
13 of the domestic petroleum industry.

14 (g) The Secretary shall issue such regulations as he  
15 determines to be necessary to carry out, and to prevent  
16 circumvention of, the purposes of this section.

17 (h) All determinations by the President and the Sec-  
18 retary under this section shall be final.

19 RELAXATION OF IMPORT CONTROLS ON CERTAIN STEEL  
20 DRILLING AND MINING EQUIPMENT

21 SEC. 703. The President is requested to enter into nego-  
22 tiations with those foreign countries which have volun-  
23 tarily limited the quantity of steel products which may be  
24 imported into the United States from such countries so as to  
25 permit the importation of increased quantities of steel pipe,

1 drilling equipment, casing, and other steel products which  
2 the Secretary of the Interior certifies are in short supply in  
3 the United States and are used in the extraction, refining, or  
4 transportation of crude oil or gas, or in the extraction of  
5 coal.

6 NEGOTIATIONS BY OIL IMPORTING COUNTRIES WITH OIL  
7 EXPORTING COUNTRIES

8 SEC. 704. (a) The President is requested to enter into  
9 negotiations with foreign countries which are major importers  
10 of petroleum and petroleum products for the purpose of form-  
11 ing an organization of which all countries which are major  
12 importers of petroleum and petroleum products will be mem-  
13 bers and which will be authorized by each member country,  
14 in conformity with subsection (b), to represent that country  
15 in negotiations with foreign countries which are major ex-  
16 porters of petroleum and petroleum products.

17 (b) Any organization formed pursuant to the negotia-  
18 tions referred to in subsection (a) shall be the exclusive  
19 agent of each member country for negotiating with foreign  
20 countries which are major exporters of petroleum and petro-  
21 leum products, and with any organization representing all or  
22 a portion of such countries, with respect to all matters relat-  
23 ing to the export of petroleum and petroleum products from  
24 such major exporting countries and the import of petroleum

1 and petroleum products into member countries of such orga-  
2 nization, and particularly with respect to—

3 (1) the quantities of petroleum and petroleum  
4 products to be exported by such foreign exporting coun-  
5 tries to member countries of such organization, and

6 (2) the prices to be paid by such member countries  
7 for petroleum and petroleum products imported from  
8 such major exporting countries.

9 (c) The Administrator of the Federal Energy Adminis-  
10 tration shall be the chief representative of the United States  
11 in any organization formed pursuant to negotiations referred  
12 to in subsection (a). Until such an organization is formed,  
13 the Administrator of the Federal Energy Administration  
14 shall, notwithstanding any other provision of law, represent  
15 the United States in all negotiations with foreign countries  
16 which are major exporters of petroleum and petroleum prod-  
17 ucts with respect to matters described in subsection (b).

18 (d) Notwithstanding any other provision of law or of  
19 any agreement entered into by the United States, if any  
20 foreign country which is a major importer of petroleum and  
21 petroleum products—

22 (1) refuses to enter into the negotiations referred  
23 to in subsection (a),

24 (2) refuses to become a member of an organization

1       formed pursuant to such negotiations, or, after becoming  
2       a member, withdraws from membership, or

3           (3) while a member of such organization, fails to  
4       abide by the decisions and actions of such organization,  
5       the products of such country, whether imported directly or  
6       indirectly, shall not, during the period of such refusal, with-  
7       drawal, or failure, be accorded most-favored-nation treatment  
8       and shall be subject to the rates of duty set forth in rate col-  
9       umn numbered 2 of the Tariff Schedules of the United States.

10   **TITLE VIII—EXPORT CONTROLS ON PETROLEUM,**  
11       **PETROLEUM PRODUCTS, NATURAL GAS AND**  
12       **COAL, AND CERTAIN DRILLING AND MINING**  
13       **EQUIPMENT**

14                                   **DEFINITIONS**

15   **SEC. 801.** For purposes of this title—

16           (1) “Secretary” means the Secretary of Commerce;

17           (2) “energy producing commodity” means any ar-  
18       ticle described in schedule 4, part 10, of the Tariff Sched-  
19       ules of the United States and coal; and

20           (3) “essential drilling or mining article” means  
21       any article which the Secretary of the Interior has  
22       certified to the Secretary is used in the extraction,  
23       refining, or transportation of crude oil or gas, or in  
24       the extraction of coal, and is in short supply in the  
25       United States.





## 1 LICENSING AND ALLOCATION OF EXPORT AUTHORITY

2 SEC. 803. (a) No energy producing commodity or es-  
3 sential drilling or mining article may be exported to any for-  
4 eign country unless the exporter has been issued a license  
5 by the Secretary for the export of a quantity of such com-  
6 modity or such article to such country, or unless such export  
7 is exempt under the provisions of section 806, or section  
8 807 (3).

9 (b) The quantity of any commodity or article available  
10 for export shall be allocated among foreign countries by the  
11 Secretary on the basis of—

12 (1) the quantity of such commodity or article ex-  
13 ported to such country during a representative base  
14 period; and

15 (2) such other factors as the Secretary determines  
16 to be fair, equitable, and sufficient to protect the inter-  
17 ests of traditional trading partners of the United States.

## 18 ISSUANCE OF LICENSES

19 SEC. 804. (a) Upon establishing allocations under sec-  
20 tion 803, the Secretary shall publicly announce such alloca-  
21 tions, and shall announce the time, manner, and place for  
22 the submission of bids for the purchase of licenses to export  
23 specified quantities of such commodities and articles to speci-  
24 fied countries.

25 (b) Each license shall be issued under this section to

1 the highest responsible bidder unless the Secretary deter-  
2 mines that no bid is sufficiently high or that there has been  
3 collusion among the bidders.

4 ADMINISTRATIVE ADJUSTMENTS

5 SEC. 805. The Secretary may make adjustments in  
6 quantities determined under section 802 and of allocations  
7 determined under section 803 if he determines on the basis  
8 of new information that original determinations were  
9 erroneous.

10 EXEMPTIONS

11 SEC. 806. (a) The Secretary may exempt from pay-  
12 ment of any license fee an export which he determines in-  
13 volves—

14 (1) the export of an energy producing commodity  
15 or an essential drilling or mining article to a developing  
16 foreign country with a serious need for such commodity  
17 or article; and

18 (2) such action would be in the best interests of  
19 the foreign relations of the United States and would not  
20 have an adverse effect on the energy needs of the United  
21 States and the program provided for under this title.

22 (b) The Secretary may exempt from the application of  
23 this title or any requirement under this title the export of  
24 any energy producing commodity or essential drilling or  
25 mining article which he determines—



1 commodity or article the domestic production of which  
2 the Secretary determines will equal or exceed domestic  
3 and foreign demand.

4 TITLE IX—TAX INCENTIVES FOR INCREASED  
5 PRODUCTION OF ENERGY SOURCES

6 TAX CREDIT FOR DOMESTIC EXPLORATORY DRILLING AND  
7 SECONDARY AND TERTIARY RECOVERY COSTS

8 SEC. 901. (a) Section 46 of the Internal Revenue Code  
9 of 1954 (relating to amount of investment credit) is  
10 amended—

11 (1) by striking out paragraph (1) and inserting in  
12 lieu thereof the following:

13 “(1) GENERAL RULE.—The amount of the credit  
14 allowed by section 38 for the taxable year shall be equal  
15 to the sum of—

16 “(A) 7 percent of the qualified investment (as  
17 defined in subsection (c)) for the taxable year,

18 “(B) 14 percent of the domestic exploratory  
19 drilling expenses (as defined in subsection (f)) paid  
20 or incurred with respect to qualified domestic ex-  
21 ploratory oil or gas wells completed during the  
22 taxable year, and

23 “(C) 14 percent of the costs paid or incurred  
24 during the taxable year for the secondary and terti-  
25 ary recovery of oil or gas from wells located in the

1 United States and its possessions (within the mean-  
2 ing of section 638).”; and

3 (2) by adding at the end thereof the following  
4 new subsections:

5 “(f) DOMESTIC EXPLORATORY DRILLING EXPENSES.—

6 “(1) IN GENERAL.—For purposes of this subpart,  
7 the term ‘domestic exploratory drilling expenses’ means,  
8 with respect to a qualified domestic exploratory oil or  
9 gas well, the sum of—

10 “(A) the intangible drilling and development  
11 costs (within the meaning of section 263 (c) ) paid  
12 or incurred with respect to such well, and

13 “(B) in the case of a well which is completed  
14 at a depth of not less than 1,250 feet, the quali-  
15 fied geological and geophysical costs, not in excess  
16 of \$50,000, assigned to such well under paragraph  
17 (3).

18 “(2) EXPLORATORY OIL OR GAS WELLS.—For pur-  
19 poses of paragraph (1), the term ‘qualified domestic  
20 exploratory oil or gas well’ means a well—

21 “(A) which is drilled within the United States  
22 or its possessions (within the meaning of section  
23 638) for the purpose of producing oil or gas in com-  
24 mercial quantities,

1           “(B) which has been completed to the point of  
2           production or abandonment, and

3           “(C) (i) neither the bottom nor any producing  
4           interval of which is within 2 miles horizontally from  
5           the nearest producing interval of any well which is  
6           or has been capable of producing oil or gas in  
7           commercial quantities, or

8           “(ii) neither the bottom nor any producing  
9           interval of which is less than 3,000 feet below the  
10          lowest part of any known commercially producible  
11          deposit of oil or gas which lies closer to the earth’s  
12          surface and is penetrated by any well capable of  
13          producing oil or gas in commercial quantities.

14          An offshore well which is a qualified domestic explora-  
15          tory oil or gas well within the meaning of the preceding  
16          sentence except that it is not drilled for the purpose of  
17          producing oil or gas in commercial quantities may,  
18          under regulations prescribed by the Secretary or his  
19          delegate, be treated as a qualified domestic exploratory  
20          oil or gas well.

21          “(3) GEOLOGICAL AND GEOPHYSICAL COSTS.—

22                 “(A) QUALIFIED GEOLOGICAL AND GEOPHYSI-  
23                 CAL COSTS.—For purposes of paragraph (1), the  
24                 term ‘qualified geological and geophysical costs’  
25                 means, for any taxable year, so much of the tax-

1           payer's geological and geophysical costs for the tax-  
2           able year as does not exceed \$50,000 multiplied by  
3           the number of qualified domestic exploratory oil and  
4           gas wells completed by the taxpayer during the tax-  
5           able year at a depth of not less than 1,250 feet.

6           “(B) GEOLOGICAL AND GEOPHYSICAL  
7           COSTS.—For purposes of subparagraph (A), a tax-  
8           payer's geological and geophysical costs for any tax-  
9           able year are the expenses (not including any over-  
10          head expenses) paid or incurred by the taxpayer, or  
11          by any component member of the same controlled  
12          group of corporations (as defined in section 1563)  
13          of which the taxpayer is a member, in the search  
14          for oil or gas within the United States and its pos-  
15          sessions (within the meaning of section 638).

16          “(C) ASSIGNMENT OF QUALIFIED COSTS TO  
17          WELLS.—The taxpayer shall, for purposes of para-  
18          graph (1), assign his qualified geological and geo-  
19          physical costs for each taxable year to qualified  
20          domestic exploratory oil and gas wells completed  
21          by him during the taxable year at a depth of not less  
22          than 1,250 feet at such time and in such manner as  
23          the Secretary or his delegate prescribes by regula-  
24          tions.”

25          (b) The amendments made by subsection (a) shall

1 apply with respect to oil and gas wells the drilling of which  
2 is commenced after the date of the enactment of this Act.

3       **ADDITIONAL TAX CREDIT FOR DEPRECIABLE PROPERTY**  
4       **USED IN EXTRACTION, ETC., OF ENERGY SOURCES**

5       **SEC. 902.** (a) Section 46 (c) of the Internal Revenue  
6 Code of 1954 (relating to qualified investment) is amended  
7 by adding at the end thereof the following new paragraph:

8               “(4) **PROPERTY USED IN EXTRACTION, ETC., OF**  
9       **ENERGY SOURCES.**—In the case of section 38 prop-  
10 erty which is placed in service for the exploration for,  
11 or the development, extraction, refining, storage, or  
12 transportation of, oil, gas, coal, or any other energy  
13 source, the qualified investment shall be two times the  
14 qualified investment determined under paragraphs (1),  
15 (2), and (3).”

16       (b) The amendment made by subsection (a) shall  
17 apply with respect to property placed in service after the  
18 date of the enactment of this Act.

19               **TECHNICAL AND CLERICAL AMENDMENTS**

20       **SEC. 903.** (a) The heading of section 38 of the In-  
21 ternal Revenue Code of 1954 is amended by inserting after  
22 **“PROPERTY”** the following: **“AND IN PRODUCTION OF**  
23 **OIL AND GAS”**.

24       (b) The table of sections for subpart A of part IV of  
25 subchapter A of chapter 1 of such Code is amended by



1 inserting after “property” in the item relating to section 38  
2 the following: “and in production of oil and gas”.

3 (c) The heading of subpart B of part IV of subchapter  
4 A of chapter 1 of such Code is amended by inserting after  
5 “Property” the following: “and in Production of Oil and  
6 Gas”.

7 (d) The table of subparts for part IV of subchapter A  
8 of chapter 1 of such Code is amended by inserting after  
9 “property” in the item relating to subpart B the following:  
10 “and in production of oil and gas”.

11 (e) Section 48 of such Code is amended by redesigna-  
12 ting subsection (k) as (l), and by inserting after subsection  
13 (j) the following new subsection:

14 (k) DOMESTIC EXPLORATORY DRILLING EXPENSES  
15 AND SECONDARY AND TERTIARY RECOVERY COSTS.—Under  
16 regulations prescribed by the Secretary or his delegate,  
17 references in section 46 (a) (4), section 46 (d) (1), and sub-  
18 sections (e) and (f) of this section to qualified investment  
19 shall be treated as also referring to domestic exploratory drill-  
20 ing expenses and secondary and tertiary recovery costs.”

21 (f) The Secretary of the Treasury or his delegate is  
22 authorized to prescribe such regulations as may be necessary  
23 to carry out the purposes of the amendments made by this  
24 title.

1 TITLE X—MISCELLANEOUS TAX PROVISIONS

2 REMOVAL OF PREFERENTIAL TAX TREATMENT FOR  
3 NEW OIL AND GAS WELLS LOCATED OUTSIDE THE  
4 UNITED STATES

5 SEC. 1001. (a) Section 613 of the Internal Revenue  
6 Code of 1954 (relating to percentage depletions) is amended  
7 by striking out subsection (d) and inserting in lieu thereof  
8 the following:

9 “(d) OIL AND GAS WELLS LOCATED OUTSIDE THE  
10 UNITED STATES.—Subsections (a) and (b) shall not apply  
11 with respect to oil and gas wells located outside the United  
12 States the drilling of which is commenced after the date of  
13 the enactment of the Energy Revenue and Development Act  
14 of 1973.”

15 (b) INTANGIBLE DRILLING AND DEVELOPMENT  
16 COSTS.—Section 263 (c) of such Code (relating to intangi-  
17 ble drilling and development costs in the case of oil and gas  
18 wells) is amended by adding at the end thereof the follow-  
19 ing new sentence: “The regulations so prescribed shall not  
20 apply with respect to oil and gas wells located outside the  
21 United States the drilling of which is commenced after the  
22 date of the enactment of the Energy Revenue and Develop-  
23 ment Act of 1973”.

1 CREDIT OR DEDUCTION FOR RESIDENTIAL ENERGY  
2 CONSERVATION EXPENDITURES

3 SEC. 1002. (a) Subpart A of part IV of subchapter A  
4 of chapter 1 of the Internal Revenue Code of 1954 (relat-  
5 ing to credits allowable) is amended by renumbering section  
6 42 as 43, and by inserting after section 41 the following  
7 new section:

8 "SEC. 42. RESIDENTIAL ENERGY CONSERVATION EX-  
9 PENDITURES.

10 "(a) GENERAL RULE.—In the case of an individual,  
11 there shall be allowed as a credit against the tax imposed by  
12 this chapter for the taxable year an amount equal to 50  
13 percent of so much of the residential energy conservation ex-  
14 penditures paid or incurred by the taxpayer during the tax-  
15 able year as does not exceed \$1,000.

16 "(b) LIMITATION.—The credit under subsection (a)  
17 for any taxable year shall not exceed the amount of the tax  
18 imposed by this chapter for the taxable year, reduced by the  
19 sum of the credits allowable under the preceding sections of  
20 this subpart (other than sections 31 and 39).

21 "(c) RESIDENTIAL ENERGY CONSERVATION EXPEND-  
22 ITURES.—For purposes of this section, the term 'residential  
23 energy conservation expenditure' means any expenditure  
24 otherwise chargeable to capital account, or any expense, paid  
25 or incurred for—

1           “(1) improvements or repairs, designed to reduce  
2           heat loss in winter and heat gain in summer, to prop-  
3           erty used by the taxpayer as his principal residence, in-  
4           cluding the installation of insulation, storm windows  
5           and doors, caulking, humidifiers, and other property  
6           designed for energy conservation, and

7           “(2) any device or system designed to utilize solar  
8           energy to provide heating or cooling which meets per-  
9           formance criteria established by the National Bureau of  
10          Standards.

11          “(d) ELECTION TO TAKE DEDUCTION IN LIEU OF  
12 CREDIT.—This section shall not apply in the case of any tax-  
13 payer who for the taxable year elects to take the deduction  
14 provided by section 219 (relating to deduction for residential  
15 energy conservation expenditures). Such election shall be  
16 made in such manner and at such time as the Secretary or his  
17 delegate shall prescribe by regulations.

18          “(e) NO ADJUSTMENTS TO BASIS.—Notwithstanding  
19 the provisions of section 1016 (a), no adjustment to the basis  
20 of property shall be made for any residential energy con-  
21 servation expenditure which is taken into account in com-  
22 puting the amount of the credit allowed by subsection (a).

23          “(f) REGULATIONS.—The Secretary or his delegate  
24 shall prescribe such regulations as may be necessary to carry  
25 out the purposes of this section.”.

1           (b) Part VII of subchapter B of chapter 1 of such Code  
2     (relating to additional itemized deductions for individuals)  
3     is amended by renumbering section 219 as 220, and by in-  
4     serting after section 218 the following new section:

5     **“SEC. 219. RESIDENTIAL ENERGY CONSERVATION EX-**  
6                                   **PENDITURES.**

7           “(a) ALLOWANCE OF DEDUCTION.—In the case of an  
8     individual, there shall be allowed as a deduction so much of  
9     the residential energy conservation expenditures (as defined  
10    in section 42 (c) ) paid or incurred by the taxpayer during  
11    the taxable year as does not exceed \$1,000.

12          “(b) ELECTION TO TAKE CREDIT IN LIEU OF DEDUC-  
13    TION.—This section shall not apply in the case of any tax-  
14    payer who for the taxable year elects to take the credit  
15    against tax provided by section 42 (relating to credit against  
16    tax for residential energy conservation expenditures). Such  
17    election shall be made in such manner and at such time as  
18    the Secretary or his delegate shall prescribe by regulations.

19          “(c) NO ADJUSTMENTS TO BASIS.—Notwithstanding  
20    the provisions of section 1016 (a), no adjustment to the basis  
21    of property shall be made for any residential energy conser-  
22    vation expenditure which is allowed as a deduction under  
23    subsection (a).

24          “(d) REGULATIONS.—The Secretary or his delegate  
25    shall prescribe such regulations as may be necessary to carry  
26    out the purposes of this section.”.

1 (c) Section 62 of such Code (relating to definition of  
2 adjusted gross income) is amended by inserting after para-  
3 graph (9) the following new paragraph:

4 “(10) RESIDENTIAL ENERGY CONSERVATION EX-  
5 PENDITURES.—The deduction allowed by section 219.”.

6 (d) The table of sections for subpart A of part IV  
7 of subchapter A of chapter 1 of such Code is amended by  
8 striking out the last item and inserting in lieu thereof the  
9 following:

“Sec. 42. Residential energy conservation expenditures.  
“Sec. 43. Overpayments of tax.”.

10 (e) The table of sections for part VII of subchapter B  
11 of chapter 1 of such Code is amended by striking out the last  
12 item and inserting in lieu thereof the following:

“Sec. 219. Residential energy conservation expenditures.  
“Sec. 220. Cross references.”.

13 (f) The amendments made by this section shall apply  
14 to taxable years ending after the date of the enactment of  
15 this Act.

16 TITLE XI—TRANSFER TO THE SECRETARY OF  
17 THE INTERIOR OF JURISDICTION OVER THE  
18 NAVAL PETROLEUM AND OIL SHALE RE-  
19 SERVES; INCREASED PRODUCTION ON FED-  
20 ERAL LANDS

21 TRANSFER OF JURISDICTION

22 SEC. 1101. (a) Effective upon the expiration of the  
23 ninety-day period following the date of the enactment of this

1 title, all jurisdiction and control of the Secretary of the  
2 Navy (including those powers and functions conferred on  
3 the Secretary of the Navy by chapter 641 of title 10,  
4 United States Code, which are necessary to the Secretary  
5 of the Interior to enable him to carry out his duties under  
6 this title) over all properties inside the naval petroleum and  
7 oil shale reserves of the United States (including lands cov-  
8 ered by leases) are transferred to the Secretary of the  
9 Interior.

10 (b) Except as provided in this title, the lands com-  
11 prising the naval petroleum and oil shale reserves shall be  
12 administered by the Secretary of the Interior in the same  
13 manner and subject to the same laws of the United States,  
14 including the mineral leasing laws, as other public lands  
15 of the United States.

16 (c) Nothing in this title shall be construed as affecting  
17 any lease, contract, or other agreement entered into prior  
18 to the date of the enactment of this title, or the carrying  
19 out of such lease, contract, or agreement in accordance  
20 with the terms thereof, or to prohibit the continuance of any  
21 production of oil and gas being carried out prior to the date  
22 of the transfer of the jurisdiction and control of the naval  
23 petroleum and oil shale reserves to the Secretary of the  
24 Interior by this title. The Secretary of the Interior is author-  
25 ized to exercise the powers and functions transferred to him

1 by this title to the extent necessary to enable him to carry  
2 out the provisions of this subsection, including those involv-  
3 ing the disposition of oil and gas products (including royalty  
4 products) from lands in the naval petroleum and oil shale  
5 reserves and lands outside such reserves covered by joint,  
6 unit, or other cooperative plans, for the benefit of the United  
7 States.

8 COMPREHENSIVE PLANS FOR LAND USE OR DISPOSITION

9 SEC. 1102. On or before the expiration of the twelve-  
10 month period following the date of enactment of this title,  
11 the Secretary of the Interior shall report to the Congress a  
12 comprehensive plan or plans containing his recommendations  
13 for a program for the best and most appropriate use or dispo-  
14 sition of the surface of the naval petroleum and oil shale re-  
15 serves lands the jurisdiction and control with respect to which  
16 are transferred by this title. In preparing any such plan or  
17 plans pursuant to this section, the Secretary of the Interior  
18 shall seek the views and recommendations of the Joint Fed-  
19 eral-State Land Use Planning Commission for Alaska es-  
20 tablished by the Alaskan Native Claims Settlement Act to  
21 the extent that such plan or plans involve or otherwise affect  
22 lands within Naval Petroleum Reserve Numbered 4.

23 CLAIMS OF ALASKAN NATIVES

24 SEC. 1103. Nothing in this title shall be construed as  
25 affecting in any manner or to any extent any right of, or



1 claim by, Alaskan Natives to ownership of any of the lands,  
2 or interests therein, comprising Naval Petroleum Reserve  
3 Numbered 4.

4 INCREASED PRODUCTION OF OIL AND GAS ON FEDERAL  
5 LANDS

6 SEC. 1104. (a) The Secretary of the Interior is author-  
7 ized and directed to require that any oil and gas field on lands  
8 or interests in lands owned by the United States, including  
9 lands on the Outer Continental Shelf—

10 (1) be fully developed as expediently as is rea-  
11 sonably justified;

12 (2) be produced at the maximum efficient rate of  
13 production where such field has not been so developed  
14 and produced; or

15 (3) be produced in excess of its maximum efficient  
16 rate of production if the Secretary finds that production  
17 at such rates is necessary to meet essential national  
18 energy requirements, except that no producer shall be  
19 required to produce crude oil in excess of the maximum  
20 efficient rate if production at such rate for a period of  
21 more than one hundred and eighty days may create ex-  
22 cessive risk of loss in the ultimate recovery of crude oil.

23 As used in this subsection, the term “maximum efficient rate”  
24 means production at a rate which may be sustained without  
25 damage or loss to the oil and gas reservoir or the ultimate

1 recovery of crude oil under sound conservation, economic,  
2 or engineering principles.

3 (b) Notwithstanding any other provision of law, the  
4 Secretary of the Interior is authorized and directed, under  
5 such terms and conditions as he may prescribe, to unitize  
6 or require the unitization of the lessees' interests in lands  
7 or interests in lands of the United States and such coopera-  
8 tive or pooling agreements as may be necessary or desirable  
9 for the joint operation of oil and gas fields referred to in sub-  
10 section (a) to achieve full development and maximum pro-  
11 duction as provided herein.

12 (c) Subject to the rights of any party under pending  
13 litigation, the Secretary of the Interior may, upon petition  
14 by a lessee or on his own motion, review and reinstate any  
15 application for permission to explore, develop, or erect devel-  
16 opment platforms within leases on the Outer Continental  
17 Shelf. Whenever the review and reinstatement leads to the  
18 granting of an application or permit which had been pre-  
19 viously denied on environmental grounds or for public pur-  
20 poses—

21 (1) if the term of the lease was not otherwise ex-  
22 tended by production of oil and gas, the period of time  
23 during which the original application was being prose-  
24 cuted before the Secretary and the Secretary's action

1       contested before the courts shall be computed to extend  
2       the primary term of such lease for a like period; and

3               (2) if the term of the lease was extended by the  
4       production of oil and gas, the costs to the lessee of prose-  
5       cuting the original application before the Secretary and  
6       contesting the Secretary's action before the courts may  
7       be offset against further royalty payments due under  
8       such lease, subject to audit and confirmation by the  
9       Secretary.

## FLOOR STATEMENT ON INTRODUCED BILL BY MR. GRAVEL

## THE ENERGY REVENUE AND DEVELOPMENT ACT OF 1973

Mr. GRAVEL. Mr. President, I am today introducing legislation to initiate and finance a national energy program, the aim of which is to develop our massive indigenous fossil fuel resources and to assist in the development of alternative sources of energy including coal gasification and liquefaction, solar, geothermal, nuclear, tidal, conversion of combustible waste materials and others.

The bill I am sponsoring would establish an energy trust fund, supported by the revenues of an energy tax—that is, a Btu tax at the source of all energy produced in, or imported into, the United States. The trust fund would be administered by the Secretary of the Treasury and the funds would be transferred to a Federal Energy Administration annually in accordance with appropriations from the trust fund. The bill would also establish a Commission on Energy Technology composed of scientists, engineers and economists. Their task would be to critically analyze the Government-sponsored research and development efforts, and the performance of the private sector in responding to the incentives provided in this bill to meet the energy needs of the Nation. This Commission would advise the executive and the Congress through public reports on the efficacy of the various options undertaken and contemplated as part of a national energy policy. The Commission would be charged with constructing an energy model on the United States and the vital information from this model would be made public on a monthly basis.

I am gratified that the administration has recently taken steps to create a Federal Energy Administration by Executive order. I have urged such an action for sometime, and in fact, gave a draft of the statutory language to create such an administration to Governor Love 1 month ago, when he was still energy czar.

While I applaud this move, it is my conviction that a clear statutory mandate is needed if we are to move our country toward a comprehensive national energy policy designed to achieve energy independence over the next decade. The bill I am introducing today would provide such a mandate and commit our country to the task of becoming energy independent by 1985.

## NEED: A NATIONAL ENERGY POLICY

It is my privilege to serve as chairman of the Subcommittee on Energy of the Committee on Finance. Our subcommittee recently conducted a series of hearings on the subject of fiscal policy and energy crisis. We heard from representatives of the administration, the Department of the Treasury, the academic community, and the private sector. In the course of our hearings, it became clear that our country lacks a long-term policy and program to increase the supply of energy in the coming years. Congress and the Executive have devoted their efforts to allocating short supplies to competing users and have centered the debate on such issues as a gasoline tax vs. rationing. The supply side of equation has not received the attention it deserves.

The legislation I am introducing today is designed to provide a policy and program to develop our massive fossil fuel resources and to coordinate efforts to reach out for ways of tapping for commercial use the ultimate sources of energy—the sun, the tides, the heat of the earth's crust.

What is the nature of the so-called energy crisis? How did it happen? What does it mean to the average American? And how can we overcome it? These are questions most Americans are asking, and questions we must answer. For a decade or more the energy crisis has been a dark storm on the horizon.

For many reasons, but primarily because we have lacked a national energy policy, we have been charting a steady course toward that storm. Despite the repeated forecasts of energy experts, despite many opportunities to change our course, we are today faced with serious shortages of fossil fuels.

The duration and degree of the crisis for the present depend less upon remedial public policies than upon the severity of the coming winter. If the weather is warm, we will get by without great discomfort. If the weather is cold, we face serious shortages of heating fuels and the prospect of closed schools and plants. For the time being we can do little more than eliminate energy waste and restrain energy consumption. But what about the winters and years ahead? If we do not make the critical decisions now, those winters and years will be bleak indeed.

For the longer term it is within our power to solve our energy problems—if we have the wisdom and intelligence and will to do so. In the past, we have not evinced those qualities, and we have not shown foresight in our use of energy. In

my opinion, the challenge ahead of us is as great as our country has confronted since World War II. If we can bring our country's finest qualities to the task, we can convert the energy crisis into energy promise and environmental opportunity.

In my judgment, the Arab oil boycott can be a golden opportunity. They did us a favor by forcing us to come to grips with all our divergent interests and make the decisions necessary that will insure our economic and military viability in the future. Had they waited until we drifted into a 50-percent dependency on them, it would have been too late to do anything but capitulate to their demands as we see happening in Europe and Japan. I am not suggesting the Arab position in the Middle East is totally in error. There is probably enough finger pointing and those situations are never black and white. But they have acted in what they perceive to be their own self-interest, and now we must act in our own self-interest. The fact is, even without an Arab-Israeli conflict we would have had an energy crisis. They only brought the crisis to a head. We can make the crisis truly advantageous to ourselves.

How the energy crisis came about is a long story—a story subject to interpretation and disagreement. Past mistakes, however, should be reviewed, not for the purpose of fixing blame, but for their value in charting the future. The energy crisis is a crisis of our own making, and resolving it will require the full cooperation and finest efforts of Congress, the executive branch, private industry, and the American people. Fortunately, the essential tools and resources are at hand; we need only the intelligence and determination to use them wisely and well.

#### THE ENERGY SHORTAGE IS NOT A RESOURCE SHORTAGE, BUT A POLICY SHORTAGE

America's energy crisis—unlike Europe's or Japan's—is not a shortage of resources. Our country is endowed with enormous fossil fuel resources.

The United States has a large potential resource base of fossil fuels sufficient to meet its needs for several hundred years at present consumption levels. What exists today is a widening gap between energy consumption and the production of available energy supplies.

While there is certainly room for error in estimating the size of our energy resources, responsible studies have concluded that our indigenous resources are truly massive. I ask unanimous consent to have printed in the Record a table which compares the potential resources base with 1972 U.S. consumption.

There being no objection, the table was ordered to be printed in the Record, as follows:

TABLE 1.—U.S. CONSUMPTION AND RESOURCES OF ENERGY FUELS

Energy fuels	Potential resources	1972 consumption
Oil <sup>1</sup> .....	346 billion barrels.....	6 billion barrels.
Natural gas <sup>1</sup> .....	1,178 trillion cubic feet.....	22.6 trillion cubic feet.
Coal <sup>2</sup> .....	394 billion tons.....	517 million tons.
Uranium <sup>3</sup> .....	1.6 million tons.....	16 thousand tons.
Oil shale <sup>4</sup> .....	189 billion barrels.....	None.

<sup>1</sup> U.S. Geological Survey.

<sup>2</sup> U.S. Bureau of Mines.

<sup>3</sup> U.S. Atomic Energy Commission.

<sup>4</sup> National Petroleum Council, U.S. Energy Outlook, a Mutual Appraisal.

Mr. GRAVEL. If we developed all oil and gas resources in this country, we would have more than 100 times our 1973 needs. Our coal resources are 600 times current production. But it will take many years and huge amounts of capital to develop these resources.

In addition to these conventional sources of energy, the United States has the technology to develop alternative sources of energy from the Sun—solar—the wind, the Earth's crust—geothermal—the power of the atom—nuclear fission and fusion—and others. There are already existing facilities to "gasify" coal, and liquefaction of coal is also possible.

A strong, well-coordinated research and development program is necessary to develop these alternatives and to translate their technological feasibility into commercial uses in the most environmentally sensible way possible. There are generally considered longer range solutions and not remedies for the short-term problem. The short-term problem, it appears, can only be mitigated by cutbacks in U.S. consumption.

We have huge energy resources, but we have failed to allocate the capital, time and technology required to develop them and to bring them to the marketplace. Let me repeat: There is no shortage of energy resources in America; there is a shortage of energy policy.

#### HUGE CAPITAL REQUIREMENTS NEEDED TO DEVELOP RESOURCES

Developing and marketing our energy resources in the future is going to require greater effort and better planning than we have demonstrated in the past. It will take money. The National Petroleum Council estimates that we will require a capital investment of between \$375 billion and \$547 billion to produce our energy needs through 1985. I ask unanimous consent to have printed in the Record a table estimating the capital requirements of the energy industries. Governor Love told us the costs would approach \$1 trillion, while the Chase Manhattan expert, John Winger, said that Banks studies estimated the capital requirements at \$1.3 trillion.

There being no objection, the table was ordered to be printed in the Record, as follows:

TABLE 2.—SUMMARY OF CUMULATIVE CAPITAL REQUIREMENTS, U.S. ENERGY INDUSTRIES 1971-85

[In billions of 1970 dollars]

	Initial appraisal	High supply	Intermediate supply	Continuation of current trends	
<b>Oil and gas:</b>					
Exploration and production.....	92.4	171.8	144.8	135.1	88.0
Oil pipelines.....	3.5	7.5	7.5	7.5	7.5
Gas transportation.....	21.0	56.6	45.0	39.8	29.5
Refining <sup>1</sup> .....	20.0	19.0	24.0	30.0	38.0
Tankers, terminals.....	14.5	2.0	9.0	16.0	23.0
Subtotal.....	151.4	256.9	232.2	228.4	186.0
<b>Synthetics:</b>					
From petroleum liquids.....		5.0	5.0	5.0	5.0
From coal (plants only).....	1.5	12.0	4.6	4.6	1.7
From shale (mines and plants).....	.5	4.0	2.2	2.2	.5
Subtotal.....	2.0	21.0	11.8	11.8	7.2
<b>Coal:<sup>2</sup></b>					
Production.....	9.3	14.3	10.4	10.4	9.4
Transportation.....	6.0	6.0	6.0	6.0	6.0
Subtotal.....	15.3	20.3	16.4	16.4	15.4
<b>Nuclear: Production, processing, enriching.....</b>					
	5.0	13.1	11.0	8.5	6.7
Total, all fuels.....	173.7	311.3	271.4	265.1	215.3
Electric generation, transmission <sup>3</sup> .....	200.0	235.0	235.0	235.0	235.0
Water requirements.....	(4)	1.1	.8	.8	.7
Total energy industries.....	373.7	547.4	507.2	500.9	451.0

<sup>1</sup> Based on maximum U.S. requirements, some of which may be spent outside the United States.

<sup>2</sup> The last 4 columns do not include capital requirements for coal production for synthetic fuels. These requirements in billions of 1970 dollars are as follows: High supply—2.0; Intermediate supply—0.8; Continuation of current trends—0.3.

<sup>3</sup> Condition 1, capital requirements under all 6 conditions postulated by the electricity task group are as follows:

Condition	Cumulative Investment (1971-85) in billions of 1970 dollars					
	1	2	3	4	5	6
Powerplant construction.....	181	183	186	169	196	163
Transmission (estimated at 30 percent of condition 1 cumulative powerplant investment).....	54	54	54	54	54	54
Total.....	235	237	240	223	250	217

<sup>4</sup> Not available.

## NEED FOR A GAME PLAN

Mr. GRAVEL. Achieving near energy self-sufficiency by 1985 will also take planning. We must bring our technology to bear on the task of researching and developing alternative energy systems and sources, including gasification and liquefaction of coal as well as solar and geothermal energy, the most plentiful and promising energy resources we have. We have to develop a game plan to do these things in an environmentally sensible way.

We must also find new ways to use fuels more efficiently. In the past we have squandered our energy resources. Our demand for energy now equals one-third the world's consumption, and a significant portion is wasted. Our use of energy has developed without restriction, without planning, and with little or no attention to efficient consumption. The average electric power plant wastes almost one-half the energy potential of the coal which it consumes. Our automobiles, our appliances, generally consume and waste ludicrously large amounts of energy. Air and water pollution are often wasted energy resources.

## NOTHING VALUABLE CAN BE "CHEAP"

Our past energy policies—or, more accurately, our past energy decisions—were designed simply to keep energy cheap, to encourage its consumption, and not to worry too much about where it was coming from. We regulated the price of natural gas and made our most valuable source of energy our cheapest fuel. We failed to realize that the regulation of natural gas prices drove other fossil fuels, particularly coal, into the ground and diverted capital from energy to other forms of investment. We foresaw the risk of relying on insecure foreign sources of energy, but we failed to take appropriate steps to reduce the risk because we wanted "cheap" foreign oil.

In our haste to protect our environment, we failed to develop and apply the technology to use fuels efficiently without polluting our air and water. Now, a 1973 Vega has the same gas mileage as a 1966 Cadillac.

We shackled our economy with price controls, creating bottlenecks, short supplies, a gush of exports, all to the detriment of the very consumers we were trying to protect.

Our tax policies discourage domestic exploration and drilling vis-a-vis foreign investment, so the capital we needed at home fled to foreign lands in search of "cheap" foreign oil.

We opened up our market to this oil by dismantling our import program and in 1972 imported about 30 percent of our consumption.

Now we find, however, that the oil our companies found abroad is no longer cheap—the average cost of foreign crude is \$6.50 a barrel versus \$4.15 for domestic crude—foreign prices are rising daily; nor is foreign crude available, because the producing nations have retaliated against us for our support of Israel in the recent Middle East crisis.

So, today we face an energy crisis with serious social, economic, and political ramifications. We are consuming oil at a rate of over 17 million barrels a day. We are producing at a rate of about 11 million barrels a day, and the rate of our production continues to fall behind the rate of our consumption. The remaining 6 million barrels of oil that we require each day must be imported. But a substantial part of our foreign supply has been curtailed, leaving us with a shortfall of some 3 million barrels a day. If and when foreign imports again become available, we will find that the cost of foreign oil will be a substantial drain on our balance of payments—at least \$40 billion by 1980—and on our economy unless we adopt policies that reduce our dependency. Incidentally, that was projected to be the drain on our balance of payments in 1985. With the changes in prices today, that has been advanced by 5 years. We will never return to a "business as usual" basis in oil again.

If our goal is energy self-sufficiency over the next decade, we must apply our imagination and intelligence to the task and get started immediately.

The first thing we must recognize is that the cost of such an effort will be high—it will be high in terms of prices to consumers, in terms of changes in the habits of our people, and in terms of trade-offs with our environmental objectives and other national goals. The energy crisis is the direct result of our decisions in the past to artificially suppress energy prices. To resolve the energy crisis, the American people must understand that the era of cheap, unlimited energy is over and the free market, guarded by incentives to plow back increased earnings, must now be permitted to work its will.

The alternative is a growing energy shortage, reduced output and the risk of economic recession.

## NO SUBSTITUTE FOR THE MARKET FOR ALLOCATING GOODS AND SERVICES

In large measure, our present energy shortages are the result of our past, ill advised attempts to intervene in the energy marketplace. We must realize that there is no substitute for the law of market supply and demand. If we are to have adequate supplies and more intelligent consumption of energy, prices must be permitted to rise. These costs will be borne by the American public either as consumers or taxpayers.

## NATURAL GAS REGULATION

The regulation of natural gas offers the best example of the folly of our past energy decisions. Natural gas is of such critical importance to the homeowner, the farmer, as well as certain segments of industry that the current natural gas shortage is in large measure the most critical energy problem facing the Nation. Yet, this country has been following a policy whose effects appear totally inconsistent with our energy needs—the Federal Power Commission's regulation of the price of natural gas at the wellhead. MIT's Paul MacAvoy and Robert Pindyck and Harvard's Steven Breyer concluded in their econometric studies that regulation of gas wellhead prices has produced the natural gas shortage that we are experiencing today.

Their study suggests that a phased deregulation would lead to a substantial increase in both reserves and production supply and that excess demand would be significantly reduced in 2 years and totally eliminated by 1979. These results are shown in table 3. The study projects that the alternative policy of strict controls—shown in table 5—would result in an increasing gap between production and consumption.

Mr. President, I ask unanimous consent to have printed in the Record two tables to which I have just referred.

There being no objection, the tables were ordered to be printed in the Record, as follows:

TABLE 3.—THE EFFECTS OF PHASED DEREGULATION

Year	Field price on new contracts (cents per million cubic feet)	Additions to reserves (trillion cubic feet)	Production supply (trillion cubic feet)	Production demand (trillion cubic feet)	Excess demand over production (continental United States trillion cubic feet)
1972.....	26.3	9.8	19.3	23.3	4.1
1973.....	29.6	12.7	22.1	24.4	2.3
1974.....	44.1	13.8	25.0	25.4	.3
1975.....	47.7	15.4	26.0	26.4	.3
1976.....	51.3	18.3	27.1	27.4	.3
1977.....	54.9	22.2	28.2	28.5	.3
1978.....	58.4	25.9	29.5	29.7	.2
1979.....	62.0	29.9	31.0	31.0	0
1980.....	65.5	34.6	32.8	32.4	.3

Source: Paul W. MacAvoy and Robert S. Pindyck "Alternative Regulatory Policies for Dealing with the Natural Gas Shortage", Bell Journal of Economics and Management Service, vol. 4, No. 2, Autumn 1973, pp. 489 and 491.

TABLE 4.—THE EFFECTS OF STRICT CONTROLS

Year	Field price on new contracts (cents per million cubic feet)	Additions to reserves (trillion cubic feet)	Production supply (trillion cubic feet)	Production demand (trillion cubic feet)	Excess demand over production (continental United States trillion cubic feet)
1972.....	26.3	9.8	19.3	23.3	4.0
1973.....	29.6	12.7	22.0	24.3	2.3
1974.....	30.5	13.8	22.8	25.6	2.8
1975.....	31.3	15.2	23.4	26.9	3.6
1976.....	32.1	16.8	24.0	28.5	4.5
1977.....	33.0	18.7	24.7	30.3	5.5
1978.....	33.8	20.8	25.7	32.2	6.6
1979.....	34.6	23.2	26.7	34.4	7.7
1980.....	35.5	26.3	28.0	36.9	8.9

Source: Paul W. MacAvoy and Robert S. Pindyck "Alternative Regulatory Policies for Dealing with the Natural Gas Shortage" Bell Journal of Economics and Management Service, vol. 4, No. 2, Autumn 1973, pp. 489 and 491.



Mr. GRAVEL. Mr. President, price controls of the past 2 dozen years have been accompanied by a steady decline in reserves—output is not being fully “replaced” in the supply line by new reserves—coupled with a huge excess in demand at the regulated prices. The underpricing of domestic natural gas distributors are direct causes of the recent contracts with Algeria and other foreign nations to import liquefied gas—LNG—at prices at least triple those on existing domestic gas contracts. Profs. James Cox and Arthur Wright of the University of Massachusetts earlier this year stated in testimony before the House Ways and Means Committee:

The principal cause of the unseemly situation (the natural gas shortage) is wrong-headed price regulation by the Federal Power Commission which has controlled field contract prices of gas for interstate shipment since about 1955. The FPC has held field prices so low that gas companies have not found it profitable to develop and produce gas for interstate shipment from new domestic reserves. Regulatory agencies at the retail level have transmitted the FPC’s underpricing to retail markets by basing rates on field prices plus pipeline charges. . . . “The solution to both the present and future shortages advanced by both industry spokesmen and others not open to conflict of interest, is to deregulate the field price of gas. The major argument for deregulating, aside from doing away with exceedingly cumbersome bureaucratic machinery, is that, on the best available economic evidence, the field prices of natural gas were set by competitive forces before the FPC began fixing prices. . . .

That is a conclusion from two University of Massachusetts professors, who realize that that State as well as the rest of New England and the upper Midwest will be the hardest hit by the natural gas shortage. The estimated shortage that we can anticipate by region, if we adopt strict controls advocated by some, is shown in the following table supplied to the subcommittee by the MIT energy group.

Mr. President, I ask unanimous consent to have printed in the Record table 5, showing regional shortages from strict controls.

There being no objection, the table was ordered to be printed in the Record, as follows:

TABLE 5—REGIONAL SHORTAGES FROM STRICT CONTROLS, EXCESS DEMAND, BY REGION

[In trillions of cubic feet]

Year	West	Northeast	Southeast	North central	South central	Total
1977.....	1.1	1.3	0.9	3.0	0.1	6.2
1978.....	1.2	1.6	.9	3.4	.2	7.4
1979.....	1.4	1.8	1.0	3.9	.4	8.5
1980.....	1.6	2.1	1.1	4.3	.6	9.7

Mr. GRAVEL. Mr. President, since natural gas at the wellhead accounts for only 10 to 15 percent of the cost of the consumer, the price increases at the wellhead which can be expected from deregulating the price of a commodity in short supply would increase consumer prices modestly. In 1972, the average annual gas bill to the residential consumer amounted to \$155.73. A recent study by Foster Associates estimated that with deregulation of gas prices, the cost would increase in the short term by \$8.30 per year using a 55-cent field market-price assumption and by \$10.03 per year at a 65-cent estimate. Over the period to 1980, the increase in residential consumer costs owing to rising field prices would be 2.8 or 3.4 percent per year at the 55 and 65 cent market price assumptions. These price assumptions are consistent with the studies of MacAvoy and Pindyck referred to above.

I believe if Americans were given the choice of paying \$10 or \$20 more to heat their homes they would gladly pay that price rather than run around looking for hot water bottles, electric heaters, or three pair of heavy underwear.

Unless increased production is made more attractive—by lifting price controls or by direct subsidy—the alternative appears to involve running out of sufficient domestic gas to heat homes and relying on Soviet or Algerian gas which, besides the risk of interruption, is triple the domestic prices and would still be higher than domestic prices even after deregulation.

In testifying before our subcommittee, Professors MacAvoy and Pindyck reached the following conclusion:

The decade of price ceilings imposed by the Federal Power Commission created 1972–73 shortages of natural gas as great as 10 percent of demand.

The operation of OPEC controls over foreign crude oil, if successful in raising crude prices to the monopoly level, has the effect of raising the demands for domestic gas even more. The most effective long term domestic policy response would be to allow gas prices to increase as well—so as to add to domestic gas production and to eliminate more elastic demanders from the combined oil-gas markets. The simulations reported here establish that this can be done at relatively low domestic gas prices—those on new contracts of 60 to 70 cents per Mcf equivalent at the wellhead to crude oil at \$3.60 to \$4.20 per barrel.

That is the conclusion of independent experts, without any industry or political axe to grind. They are MIT professors who have done their homework. Natural gas is but one example of how price controls have distorted the efficient allocation of resources. Another example of the importance of prices to energy supply and demand is the case of gasoline.

During the last 2 years, the real price of gasoline has declined almost 8 percent according to Paul McCracken, former Chairman of the Council of Economic Advisors, whose excellent article on rationing against the marketplace, appears as Appendix A. Is there any wonder why we now face a shortage of gasoline? The market price for any commodity must reflect the costs of production and distribution and a reasonable profit expectation.

Recent experience with controls on the price of one product and no controls on all costs or market substitutes and the subsequent market distortions caused thereby should be enough evidence to question the wisdom of FPC pricing policies. As has been widely reported in the press last summer, controls over the price of chicken but not the cost of feed, led to the drowning of baby chickens. Similarly, controls over the price of gas but not the cost of producing it, prevents a lot of natural gas from being found.

#### DEFINING THE ROLE OF THE PUBLIC AND PRIVATE SECTOR

The urgent task confronting the Congress and the executive branch is to define the respective roles of the public and private sectors in carrying out a national energy policy. In the past, government has sought to intervene unreasonably in the marketplace, and today we are suffering the consequences. In the future, we must be certain that government and industry each perform the roles for which they are best suited. The proper function of government is not to thwart or supplant free market forces, but to supplement them, to give them direction, and when necessary and desirable, to extend their reach.

Clearly there are functions, such as long term energy research, which are best carried out under government sponsorship. Just as clearly, there are functions, such as energy production, for which the private sector is best suited.

Both the Congress and the Executive need to define more clearly and realistically the respective tasks confronting our government and our private sector. We must appreciate the interrelationship which exists among various forms of energy. And, we must work harder to coordinate and consolidate our many diverse and often contrary national priorities. Above all, we must develop a comprehensive and consistent national energy policy, a policy which recognizes the essential role of energy in our national life and which is directed at making adequate supplies of safe and clean energy available for our people.

#### TRADE POLICY AND NEAR ENERGY SELF-SUFFICIENCY

Given the economic and political facts of life and the importance of energy to our national economy and security, a "free trade" philosophy in energy is simply contrary to the goal of achieving near energy self-sufficiency. With over 63 percent of the proven free world crude oil reserves in the Middle East and much lower extraction costs in that area of the world, a free trade philosophy in oil will result in the decimation of the U.S. domestic industry and a reliance on extremely insecure sources of supply. Recent experience demonstrates the folly of becoming dependent on foreign oil. Ever since 1947 the Congress has expressed its concern over becoming excessively dependent on insecure foreign sources of supply for a vital raw material such as oil. A history of this concern is described in Appendix B, including a magnificently far-sighted speech in 1959 by the chairman of the Committee on Finance (Mr. LONG).

The embargo by the oil exporting Arab countries in November finally brought home what so many Members of Congress, including Senators Long, SYMINGTON, ROBERT C. BYRD, and others still in this body, had warned against for so many years.

If we want to have a secure source of domestic energy we are going to have to pay more for our consumption and we are going to have to protect the industry against excessive imports. It is just that simple.

It should be clear now that foreign sources of petroleum cannot and should not be relied upon to satisfy any significant portion of U.S. energy needs. We should have listened to the warnings that were raised all during the fifties and sixties.

Instead of heeding this advice we went in the opposite direction. We began to view the oil industry as a bunch of robber barons out to take the American public for a ride. So we proceeded to dismantle the oil import program, cut the depletion allowance, place price controls, bring antitrust suits, stop offshore drilling and a whole host of other measures to cripple industry efforts to bring on domestic sources of supply. The 1969 Tax Reform Act alone cut the capitalization of the oil industry by \$500 million, which is paid by the consumer today. As a result, two things happened: we drove many of the independents out of business and encouraged the majors to invest abroad and in real estate and other ventures totally unrelated to oil. As a result, oil companies are today becoming conglomerates—the “oil business” is almost a dirty word in American politics. Now the talk is to set up a Government-owned oil company to do the job that privately owned companies allegedly cannot do. Well, if anybody has any faith that the bureaucrats in Washington can run an oil business, he is, at best, naive.

#### SUMMARY OF THE BILL

The bill I am introducing today would give us such a national energy policy and commit us on the road to energy independence. At the center of the “Energy Revenue and Development Act of 1973,” is a proposal to create an energy trust fund financed with the revenues of a tax on all fossil fuels produced or imported into the United States. This fund would raise \$50 billion over a 10-year period. Initially, a tax of 4.1 cents per million Btu would be levied at the source of production or importation. Thereafter, the tax would increase gradually until a maximum rate of 6.5 cents per million Btu is reached in 1978. From 1978 until 1985 the tax would be decreased gradually per year until a tax rate of 2.8 cents per million Btu is reached. To give some idea of what this would mean in terms of a barrel of oil or a ton of coal or a trillion cubic feet of gas, Dr. Warren Donnelly of the Library of Congress, who gave us invaluable assistance in computing the tax schedule, estimated that at 5 cents per million Btu—which is ½ cent higher than the average rate of tax in the bill—the increase in a crude barrel of oil would be 29 cents, a short ton of coal, \$1.20, and a thousand cubic feet of natural gas, 5 cents.

The estimated revenues from the tax are shown below:

Mr. President, I ask unanimous consent to have printed in the Record table 6 showing estimated income from energy tax, 1974 to 1985.

There being no objection, the table was ordered to be printed in the Record, as follows:

TABLE 6.—ESTIMATED INCOME FROM ENERGY TAX, 1974-85

Year	Estimated national energy input <sup>1</sup> quadrillion British thermal units (10 <sup>12</sup> )	Proposed tax rate (cents per million British thermal units)	Tax income (billion)
1974.....	77.7	4.1	\$3.2
1975.....	80.3	4.5	3.6
1976.....	83.4	5.2	4.3
1977.....	86.0	5.9	5.1
1978.....	89.0	6.5	5.8
1979.....	92.0	5.9	5.4
1980.....	96.0	5.2	5.0
1981.....	97.8	4.5	4.4
1982.....	100.6	4.1	4.1
1983.....	103.5	3.4	3.5
1984.....	107.2	2.8	3.1
1985.....	116.6	2.2	2.5
Total.....			50.0

<sup>1</sup> Walter G. Dupree and James A. West, United States Energy Through the Year 2000. Department of the Interior, 1972, p. 7; for the years 1975, 1980, 1985. Other yearly values by graphical extrapolation.

Mr. GRAVEL. Mr. President, the revenues from this energy tax would be placed in an energy trust fund administered by a Federal Energy Administration. As with other Federal trust funds, the Secretary of the Treasury would serve as trustee and would be empowered to invest the fund receipts in U.S. Government securities.

The Federal Energy Administration (FEA) would oversee the formulation of a national energy policy and undertake a national program of energy development. Energy functions currently carried on by the Department of Interior, Transportation, Commerce, and other agencies would be transferred to the FEA. The Federal Energy Administration would plan for the intelligent and environmentally sound development of U.S. fossil fuel resources and the bringing on stream for commercial uses the unconventional forms of energy—solar, geothermal, tidal, nuclear, fusion, et cetera. The agency could provide loan guarantees to the private sector to develop such resources as shale oil, coal gasification and liquefaction.

In order to bring about energy production and development in the most effective way possible, the FEA would be authorized to enter into contracts with private persons for research and development and the exploration and drilling of public lands. These contracts would include provisions for loan guarantees, where appropriate, purchase agreements for energy resources discovered or produced. These contracts would also contain provisions imposing an excess profits tax to recapture corporate profits exceeding 20 percent, when they are not plowed back into the business.

Another feature of my bill, which I believe merits careful considerations, is a provision which creates an independent Commission of Energy Technology Assessment (CETA).

This office, which would be composed of 21 eminent scientists, engineers, and economists would establish standards and goals for the research and development being conducted under the sponsorship of the Federal Energy Administration. The CETA would also prepare cost/benefit analyses, evaluate alternative forms of energy, and project our energy needs in the future and how these needs can most effectively be met. It would critically evaluate all the publicly financed research and development efforts and be a kind of watch dog to protect the taxpayers' money from being wasted on ill-conceived projects. It would enter into contracts with private nonprofit institutions—educational institutions and research centers—to perform adversary studies on publicly financed programs and on the efforts of the private sector.

The Energy Revenue and Development Act of 1973 would also phase out, over a period of one year, price controls on crude oil and petroleum products, price ceilings on new natural gas, and on existing gas as the contracts come due.

Elimination of price controls would be coupled with an excess profits tax to insure there is no rip off by the producers or by anyone contracting with the Federal Energy Administration, and that the moneys are put back into the search for new energy resources.

#### FOUR BASIC OPTIONS

There are basically four basic approaches to resolve the energy shortage and they are not necessarily mutually exclusive.

#### THE INCENTIVE OPTION

One option is to provide tax or other incentives to produce and deliver energy supplies. Tax incentives tend to decrease price and stimulate supply (and, because of the lower prices, also demand).

#### CONSERVATION TAXES

Another option is to tax production or consumption. This option could dampen demand by increasing price. Its effect on supply depends on whether the moneys collected are invested in the search for new energy sources.

#### RATIONING

A third option is to adopt rationing. This would force a decrease in demand, but does not increase supply. It could lead to a "black market" or a "white market" for the ration tickets depending on how it is managed. I think the preference of all of us in this body would be a white market, if we had to go to

the rationing route for a period of time. But again rationing does nothing to increase supply which is what we need to do to become energy independent.

#### FREE MARKET

A final option is to let the market itself allocate scarce resources. In the short run this will increase price and reduce demand. With increased prices, there will be an incentive by the producers to invest in new supply. As this happens prices will settle out at an equilibrium level. This is by far the best long-term option. It is based on the economic theories that have worked in the capitalistic system for centuries.

Ultimately, in a shortage situation prices will increase under any system. But if we let the market work we will encourage the enormous volume.

Unlike Europe and Japan, the United States has relatively great amounts of energy resources which have not been developed to anywhere near their potential. If these resources are to be developed, it will be necessary to allow market forces to operate so that the relative prices of the competing fuel sources will be high enough to permit the economically feasible development of such sources. Given this current scarcity, it is reasonably clear that market forces will bring about sufficient price increases to promote the development of these additional methods for supplying energy, such as crude oil, coal, liquefaction, gasification, oil shale, and so forth. It is also reasonably clear that the prospective price increases would be sufficient to begin to encourage the great amount of capital which will have to be invested in the industry in order to discover, develop, and produce the required fuels.

According to several experts I have talked to, a price of \$7 per barrel for crude oil would be adequate to enable the industry to develop sufficient alternative sources of fuel to meet much of the Nation's needs. In terms of gasoline for instance, this \$7 price would translate into a price increase of approximately 10 cents per gallon at the pump. This is a reasonable price increase, and the consumer would most likely be willing to pay such prices in order to be able to have the fuel that he needs.

On the other hand, the industry will not be willing to spend the billions of dollars which would be required to develop these new methods for providing energy unless it can be sure that the price will remain at levels high enough for the long period of time required to develop these new methods.

Given this need to maintain appropriate domestic prices, I have proposed in my bill the creation of a variable levy system. The levies would be essentially the difference between prevailing domestic prices and the price of imported petroleum. At present, with foreign crude oil selling at higher than domestic prices there would be no levy. However, with a "lifting price" or extracting cost as low as 13 cents per barrel for Saudi Arabian sweet crude, there is always the possibility that Saudi Arabia and other Arab countries could set prices well below prevailing domestic prices so as to insure that the United States would never be able to develop major new supplies of energy resources. The variable levy system itself would be structured somewhat along the lines of the system utilized by the European Community in its common agricultural policy (CAP).

The second trade measure in my bill would establish a quota of 5 percent on imports from nations that embargo their shipments to the United States. These Arab nations have demonstrated convincingly that we cannot depend on them. The import licenses for their oil would be auctioned off to the highest bidder. This would bring in additional revenues to the Federal Government and avoid the bureaucratic machinery and favoritism that characterized the oil import program.

#### TAX INCENTIVES FOR DOMESTIC DRILLING

The subcommittee took testimony from a number of experts on the energy situation and it became apparent that providing foreign depletion allowances and intangible drilling expenses in countries which embargo shipments of oil to the United States makes little sense. It also may not make much sense to provide a foreign tax credit in those instances.

Senators RIBICOFF and MONDALE have introduced legislation which would effectively end these tax incentives for income and expenses in those countries which embargo oil shipments to the United States. These proposals should be seriously considered.

My own proposal would end the foreign depletion allowance prospectively, as well as intangible drilling expensing on foreign production. That seems to be

equitable to existing investments and also tells our corporations: "Look, we need your capital back home to invest in our own massive energy resources." My proposal does not affect the foreign tax credit, which is a very complex area, and there are good arguments for avoiding double taxation by retaining the credit.

In addition, I believe that for the foreseeable future we will have to adopt some kind of additional fiscal incentive to encourage domestic drilling and exploration in the United States. Accordingly, I have in my bill a 14-percent investment tax credit for the costs of new drilling, new refinery capacity, and the costs in transporting, storing, and distributing all sources of fossil fuel energy—coal, gas, and oil.

The PRESIDING OFFICER. The time of the Senator from Montana has expired.

Mr. GRIFFIN. Mr. President, I ask unanimous consent that I may be permitted to yield 5 minutes of my time to the Senator from Alaska.

The PRESIDING OFFICER. Without objection, it is so ordered.

Mr. GRAVEL. In the long run, I believe the free market is the best incentive for encouraging investment. However, in the short run, we may need to adopt a tax credit for domestic investment in our own resources. This will tend to keep prices lower than they would otherwise go and also attract capital into these ventures.

#### INFRASTRUCTURE SHORTAGE—STEEL PIPE, DRILLING EQUIPMENT, RIGS, ET CETERA

It also became apparent during our hearings that there is a serious shortage of equipment needed to explore for new domestic sources of oil and gas. I am referring to such materials as steel pipe, rigging equipment, casting, drills, and the like. This shortage is to a large extent the result of Government price controls and import restraints on these products. Accordingly, my bill would direct the President to remove price controls on these products and any others in short supply that are needed in the exploration, extraction, and transportation of petroleum and petroleum products and natural gas. It would also direct the President to inform those foreign nations that are restraining their exports of these products to the United States to remove these voluntary export restraints.

#### U.S. NEGOTIATOR AND A CONSUMERS UNION

There are several other aspects of the energy problem that must be considered. The producer countries have a very formidable cartel—OPEC—which in a sellers market is driving petroleum prices out of sight. To counter this producers union, two things are necessary.

First, we must appoint a high level Government official to negotiate on price, instead of having the producing nations pick off one private company after another and use salami tactics to drive the prices through the roof. Thus, my bill would direct the Energy Administrator to be the negotiating arm of the United States in dealing with the producing nations.

Second, one consuming nation, just like one private company, cannot be in a strong bargaining position if the other consuming nations capitulate to the producers cartel demands. Thus we need a "consumers union" of importing countries which will bargain collectively with the producing nations. I understand that because of the relative difference in dependencies, other consuming nations are not very interested in this approach. As an incentive to them, I would suggest that we deny any consuming nation most-favored-nation treatment in our market unless they join us in the consumers union. That is strong medicine, but this is such a serious problem, the medicine is needed.

I hope this suggestion will not be misinterpreted within the Arab community. It is a constructive suggestion. They are pursuing their policies and goals for their own best self-interest. Certainly they are entitled to do that; but as occurs many times in the actions of nations, things can get out of hand. They have an organization, which is not a monolith, but certainly permits them to act in some degree of unison. They think this is in their interest.

I think it would be in our best interest to act similarly, in unison as consuming nations. Collectively it would be in the best interests of all nations, the producing and the consuming nations, to have a consumers' union. Then we would have a vehicle to clear disagreements and to negotiate on an even basis. Such a vehicle would assure a reasonableness which might not otherwise be present; the alternative would be a recourse to violence.

So I would hope this suggestion would be looked upon as a constructive proposal to handle problems that will inevitably occur in the future.

In conclusion, Mr. President, I wish to emphasize to my colleagues that the Energy, Revenue, and Development Act of 1973 offers a comprehensive approach

to this country's energy problems by increasing our supply of safe, clean energy. It is designed to help bring about near energy self-sufficiency by 1985. It would lead us to national energy policy and program and commit our country to the task of developing our indigenous fossil fuel resources as well as alternative sources and systems of energy including coal gasification and liquefaction, solar, geothermal, and others. It is the intention of the Subcommittee on Energy to hold hearings on this bill shortly in the week of January 14. I invite all interested parties to submit comments for the record of those hearings. I urge my colleagues to give this bill their careful attention, and I certainly welcome their support.

Mr. President, I ask unanimous consent that appendixes be included in the RECORD along with my remarks. I also ask unanimous consent that speeches made in prior years, which I have here from prior Congressional Records, also be inserted in the Record. I think these statements demonstrate, from the historical point of view, that an awareness of the problem did exist in the Congress. A proper definition of the problem did exist at an earlier time, but, for some reason, we did not heed the warnings of those in this body concerned with becoming overly dependent on foreign supplies for a vital raw material.

I hope we will have the wisdom and good sense to realize these errors and chart a course that will be in the best interests of this Nation and, I think very sincerely, in the best interests of all human beings on this planet.

The PRESIDING OFFICER. Without objection, the several requests are agreed to. The material ordered to be printed in the Record is as follows:

#### APPENDIX A

##### COUPON BOOK ECONOMICS

(By Paul W. McCracken)

During the weeks immediately ahead decisions will be made about energy that will in quite fundamental ways shape not only our economy but also the future course of American life. And there is an uncomfortable high probability that we shall set ourselves on a course of action that will be difficult to reverse and bitterly regretted.

That we confront a difficult energy problem is clear enough. We are consuming oil at the rate of just over 17 million barrels per day. Domestic production is about 11 million and not rising. Directly and indirectly roughly one-third of the six million that must be imported has been coming from the embargo area. The annual growth in demand could be expected to add roughly another million barrels per day to our requirements, and this also would in the normal course of things have come from the Persian Gulf because that is where the oil is.

This confronts us with a tough problem, one whose gravity is not to be minimized. Looking toward the year ahead we have a shortfall in probable petroleum supply of 15% to 20% relative to normal demand, and oil and gas in turn supply roughly half of our energy requirements. When we remember that a spot shortage at one point can have domino effects in other directions, the large potential that this shortage has for disorganizing our economic life becomes apparent. But for a nail . . . some kingdoms can be lost.

What should our energy programs do for us? What are the guidelines for determining what we should do and should not do? Precisely because the problem is so urgent we need to take time enough to perceive the longer run consequences of our short run actions. We have this problem of energy today in part because we did not take time a few years ago to think through the longer range results of some immediate actions. In a seizure of evangelical fervor, for example, we charged mindlessly ahead on some environmental standards that were clearly building up requirements for oil and gas which could not be met even before the Mideast war. The result of this theologization of environmental programs, which tended to treat questions about consequences almost with contempt or as sin, is that as these painful consequences now become more apparent the perfectly good cause of having regard for our environment is threatened with being discredited. If so it will have hard going to recover support from a public understandably suspicious because of having been burned once.

There will in this urgent energy problem again be a tendency to act as if the problem is so urgent that we must mount our steed and ride instantly off at top speed without even taking time to make sure that we are headed in the right direction.

## SOME SOCIAL VALUES

Efforts at voluntary conservation are, of course, commendable. There are even social values to be derived at these joint efforts for the common good. And there can be no doubt that habits about energy use, reflecting quite rational responses to cheap energy prices (and not, as some comments seem to suggest, a new variant of original sin), have led to some uses that can readily be curtailed. Indeed, it is possible that something approaching half of our shortfall could be taken up by such careful using of energy more sparingly.

Rationing commends itself to many as the way to handle the remainder of the job. It seems fair because "everybody would be treated alike."

If we do go into rationing, certain predictions can confidently be made. One is that what starts out as "treating everybody alike" will be a program that each citizen is sure is discriminating against him. For one thing there is infinite variation in people's situations. Giving everybody X gallons per week, or even everybody in Z category X gallons, will be just fine for the inactive family whose car spends most of its time getting dusty in the garage; and it might be lethal for the active family using the car for all manner of things. There is a way to use this enormous variation in individual situations, but more of that later.

The result is that a rationing program in practice would waste gasoline and oil because simplistic and across-the-board rules, inevitable in such a broadside program, would put substantial amounts of these scarce products into the hands of those for whom the need would be of secondary urgency.

A more unfortunate aspect of rationing would be its adverse effect on public morality. If there is one lesson to be drawn from experience with these programs it is that black markets would flourish. Thus those with "flexible" standards of morality, or who have political pull, or who can work some other angle will do relatively well, while the ordinary decent citizen will wind up with the dry gasoline or oil tank. Economies that are managed by license and edict and coupon books are also economies with pervasive corruption and graft. This is no accident. Those possessing the authority to grant favorable decisions possess something of great value, and there will be growing numbers who are willing to pay the price. All they will need to do is look around them to conclude that almost "everybody does it."

The major weakness of the rationing approach is that it slows down the process of curing the problem. Businesses inevitably will be reluctant to commit capital for products that are to be sold in a rationed market. It is one thing to bet one's ability to match wits with market forces and quite another to bet against the vagaries of government decisionmaking.

Rationing, which starts out as a holding action during a shortage, will incalculably prolong the shortage.

Another approach for dealing with the shortage is the imposition of a stiff tax on gasoline and fuel oil. This would be vastly superior to rationing. It encourages every user to examine his own unique and peculiar combination of circumstances for ways to use scarce, high-priced products more sparingly. There is the usual skepticism about whether a higher price would have much effect, but the limited factual evidence available suggests that with something like a 20-cent-per-gallon tax on gasoline the shrinkage in use would be demand into balance with limited supplies even with the absence of Mideast oil. And this would "treat everybody alike" in the meaningful sense that the intensity of pain for the last gallon given up in each case would be more nearly equal for all people than with rationing. It would use these scarce resources more efficiently.

This tax approach has two drawbacks. One is that an increase in price would hit lower income groups harder than those with high incomes. This is less certain than seemingly obvious. A lower income family (e.g., a retired couple) may find it easy to avoid the problem by curtailing use while a family with a larger income and less ability to cut usage will feel the bite. Moreover, there are far more effective ways directly to take care of society's quite legitimate concern about income distribution than to paralyze the pricing system. In this specific case, for example, we could have a rising deduction from income taxes going down the income scale with the credit payable in cash if it exceeded the income tax liability. The better approach, of course, would be to have a full-scale income maintenance program.

The more serious though less obvious drawback of the tax approach is that it does nothing to cure the fundamental need for enlarging our supply capability. It uses the pricing system to ferret out usages of secondary importance, but it does not use the pricing system to make a commitment of capital into energy pro-



duction more profitable. Thus it would be a policy to allocate scarcity but not to eliminate it.

This leads to the third approach. Ever since the pricing system was invented, there has been a way to handle the shortage while fundamental forces are being set to work to correct it. What Americans most need now is enough clear-headedness at both ends of Pennsylvania Avenue so that higher prices for energy can start to get us more oil and gas. This will mean higher profits for the energy companies, but the U.S. Treasury will be a majority participant in the increased profits.

Here we so need to keep some specific facts in perspective. During the last decade the real price of gasoline excluding taxes (i.e., this price adjusted to allow for changes in the value of the dollar generally) declined 8% and during the last two years the real price of gasoline has declined almost 8%. A change in the ever more bargain basement character of these prices was about due in any case.

Of the three ways to regain balances between demand and more limited supplies, an outright higher price would be most effective, and rationing at the outset would be most attractive (and, in the end, most disappointing). We have, therefore, a good chance that within the next few months rationing of gasoline and fuel oil will be adopted. Is there anything that can be done to minimize its perverse effects? Not much. Rationing, particularly peacetime rationing, almost inherently works badly and encourages black-marketeering, corruption, and waste.

#### AVOIDING A BLACK MARKET

One modification of the rationing system would, however, be helpful if the political process insists on going down that road. That would be to allow gasoline coupons to be freely bought and sold. In this way gasoline would be utilized for the most urgently felt needs. There would more nearly be equal sacrifice "at the margin." There would be no black market. And demand for gasoline would still be held in the aggregate to supplies available if the right total amount of coupons had been issued.

After this system operated for a while, we would begin to perceive that what we had was a free market for gasoline plus a slightly disguised income redistribution program. It might then occur to us that we should have a straightforward income distribution program plus the straightforward superiority of the price system in free and open markets to handle the economy's allocations function.

If we could be sure of that result, a bout with rationing would almost be tempting.

#### APPENDIX B

##### HISTORY OF CONGRESSIONAL CONCERN OVER EFFECT OF OIL IMPORTS ON NATIONAL SECURITY

The Congress has long recognized the need for preserving a healthy petroleum industry in the United States. On January 31, 1947, the Special Committee Investigating Petroleum Reserves, set up by the Senate, concluded as follows:

"In the final analysis the reserves within our own borders are more likely than not to constitute the citadel of our defense.

"It follows that nothing should be done to weaken the productive capacity of domestic reserves, and that every possible step should be taken to increase these reserves and continuously to develop them to such a degree as would occasion no regret in the event of war." The Committee's report went on to say: "This Nation now faces two alternatives:

"Either—

"1. To await with hope the discovery of sufficient petroleum within our boundaries that the military requirements of the future will occasion no concern, and in the meantime to depend upon foreign oil and trust that war will not cut off our imports;

"Or—

"2. To take steps to guarantee a domestic petroleum supply adequate for all eventualities by means of:

"(a) Incentives to promote the search for new deposits of petroleum within the boundaries of the United States and in the continental shelf; and

"(b) The continuation of the present program looking to the manufacture of synthetic liquid fuels to supplement our domestic crude supply.

"All the facts before us impel the choice of the second alternative."

That was back in 1947. Congress continued to be concerned with the effect of imports of foreign oil on the national security during the 1950's.

In 1954, the Congress again expressed its concern over the effect of lowering import barriers on the industry.

Section 2 of the Trade Agreements Extension Act of 1954 provided that no action was to be taken "to decrease the duty on any article" if the President found that such reduction "would threaten domestic production needed for projected national defense requirements." This amendment was added on the Senate floor after the one-page 1954 Trade Extension Act had passed the House and had been approved by the Senate Finance Committee without amendment.

The section 2 amendment was proposed by Senator Symington and passed the Senate the following day. In the Congressional Record, the Senator briefly expressed his reasons for offering the amendment:

"I plan to offer an amendment, which in effect would require testing tariff decreases against defense requirements.

"I believe it should be mandatory for the administration to make certain that no tariff should be reduced, whenever such reduction would threaten continued domestic production necessary to meet our projected defense requirements.

"I refer to articles identifiable as necessary for national defense."

In 1955, the Congress adopted the Senate Finance Committee's national security amendment to the Trade Agreement Extension Act, which read as follows:

"In order to further the policy and purpose of this section, whenever the Director of the Office of Defense Mobilization has reason to believe that any article is being imported into the United States in such quantities as to threaten to impair the national security he shall so advise the President and if the President agrees that there is reason for such belief, the President shall cause an immediate investigation to be made to determine the facts. If, on the basis of such investigation and the report to him of the findings and recommendations made in connection therewith, the President finds that the article is being imported into the United States in such quantities as to threaten to impair the national security, he shall take such action as he deems necessary to adjust the imports of such articles to a level that will not threaten to impair the national security."

On April 23, 1957, upon review of the oil import situation and projected increases in oil imports, the Director of the Office of Defense Mobilization "advised the President pursuant to section 7 of the Trade Agreements Extension Act of 1955, that he had reason to believe that crude oil is being imported into the United States in such quantities as to threaten to impair the national security."

On July 29, 1957, President Eisenhower approved a Special Cabinet Committee's report establishing what became known as the "Voluntary Oil Import Program".

#### MANDATORY OIL IMPORT PROGRAM—1959

This voluntary program continued in operation until March 10, 1959, at which time the President established the mandatory oil import program. In contrast to the voluntary program which covered only crude oil imports, the mandatory oil import program covered imports of crude oil and its products and derivatives.

The Mandatory Program was established after the Director of the Office of Civil and Defense Mobilization, in his memorandum for the President quoted the Secretary of Commerce as follows:

"It is my considered opinion that the present rate of imports of crude oil and its derivatives and products is a major contributing factor in the decline in drilling operations both for exploration and development in the search for new oil reserves . . . Continuation of this trend will inevitably result in lowering of our available reserves."

The Mandatory Oil Import Program (MOIP) is an example of a trade-related program which was conceived to achieve one purpose—to protect a domestic industry deemed vital to the national defense—but whose implementation was fraught with special favors and exemptions. In some respects changed economic circumstances dictated the constant evolution of the program. But in other respects the program bordered on scandalous and silly exemptions.

Critics began to attack the program with increasing force in the late 1960's, feeling that the solution to the United States oil problem was simply to abandon import controls. They, like most other Americans, failed to perceive that once this nation became dependent on foreign sources for a vital raw material it would be a sellers' market and the imported oil would no longer be cheap.

As the program was unraveled and finally abandoned, U.S. imports shot up dramatically, both in volume and value. With a seller's market prices more than doubled, the volume of imports rose by more than 50 percent between 1971 and 1973, while the value increased by more than 100 percent.

## APPENDIX C

## EXPLORATION (GEOPHYSICAL CREW ACTIVITY, ACREAGE UNDER LEASE, WILDCAT WELLS DRILLED)

Year	Crew months worked	Total acres leased Jan. 1 (thousands)	Wildcat wells		
			Total	Dry	Percent dry
1953	8,675	NA	13,113	10,633	79.9
1954	7,969	315,568	13,100	10,389	79.3
1955	8,240	NA	14,942	11,832	79.2
1956	7,857	383,863	16,207	13,118	80.9
1957	7,242	NA	14,714	11,904	80.9
1958	5,731	371,146	13,199	10,632	80.6
1959	5,696	382,607	13,191	10,577	80.2
1960	5,207	424,251	11,704	9,515	81.3
1961	5,024	416,871	10,992	9,022	82.1
1962	4,231	408,870	10,797	8,815	81.6
1963	4,174	387,457	10,664	8,686	81.5
1964	4,406	372,408	10,747	8,951	83.3
1965	4,471	375,306	9,466	8,050	84.6
1966	3,835	350,895	10,313	8,705	84.4
1967	3,496	333,858	8,878	7,361	82.9
1968	3,390	325,106	8,806	7,439	84.5
1969	3,259	332,005	9,701	8,001	82.5
1970	2,521	343,213	7,693	6,422	83.5
1971	2,760	332,647	6,922	5,834	84.3
1972	NA	350,725	7,539	6,254	83.0

## DRILLING (ROTARY RIGS ACTIVE AND TOTAL WELL COMPLETIONS)

Year	Rigs active	Total well completions					Total
		Oil	Gas	Dry	Service		
1953	2,613	25,762	3,806	18,449	1,262	49,279	
1954	2,509	29,773	3,977	19,168	1,012	53,930	
1955	2,687	31,567	3,613	20,742	760	56,682	
1956	2,619	30,730	4,543	21,838	1,049	58,160	
1957	2,429	28,612	4,626	20,983	1,409	55,024	
1958	1,923	24,578	4,803	19,043	1,615	50,039	
1959	2,074	25,860	5,029	19,265	1,670	51,764	
1960	1,746	21,186	5,258	17,574	2,733	46,751	
1961	1,763	21,101	5,664	17,106	3,091	46,962	
1962	1,637	21,249	5,848	16,682	2,400	46,179	
1963	1,501	20,288	4,751	16,347	2,267	43,653	
1964	1,502	20,620	4,855	17,488	2,273	45,236	
1965	1,388	18,761	4,724	16,025	1,922	41,432	
1966	1,270	16,780	4,377	15,227	1,497	37,881	
1967	1,134	15,329	3,659	13,246	1,584	33,818	
1968	1,170	14,331	3,456	12,812	2,315	32,914	
1969	1,195	14,368	4,083	13,736	1,866	34,053	
1970	1,038	13,020	3,840	11,260	1,347	29,467	
1971	975	11,858	3,830	10,163	1,449	27,330	
1972	1,107	11,306	4,928	11,057	1,464	28,755	

## DISCOVERIES (NEW RESERVES ADDED)

Year	Liquid hydrocarbons (million barrels)			Natural gas (trillion cubic feet)	Crude oil per new oil well (barrels)	Natural gas per new gas well (million cubic feet)
	Crude oil	Gas liquids	Total liquids			
1953	3,296	744	4,040	20.9	127,940	5,480
1954	2,873	107	2,980	9.6	96,496	2,423
1955	2,871	515	3,386	22.0	90,949	6,085
1956	2,974	810	3,784	24.8	96,778	5,470
1957	2,425	137	2,562	20.2	84,755	4,364
1958	2,608	858	3,466	19.0	106,111	3,946
1959	3,667	703	4,370	20.8	142,131	4,132
1960	2,365	725	3,090	14.2	111,630	2,696
1961	2,658	695	3,353	17.3	125,965	3,059
1962	2,181	733	2,914	19.6	102,640	3,359
1963	2,174	878	3,052	18.4	107,156	3,877
1964	2,665	609	3,274	20.4	129,243	4,212
1965	3,048	832	3,880	21.5	162,464	4,545
1966	2,964	894	3,858	20.4	176,638	4,650
1967	2,962	930	3,892	22.0	193,228	6,000
1968	2,455	686	3,141	13.8	171,306	3,998
1969	2,120	281	2,401	8.5	147,550	2,082
1970 <sup>1</sup>	3,089	308	3,397	11.6	237,250	3,021
1971 <sup>1</sup>	2,318	347	2,665	10.1	195,480	2,637
1972 <sup>1</sup>	1,558	238	1,796	9.8	137,803	1,987

<sup>1</sup> Excludes 9,600,000,000 barrels of crude oil and 26 trillion cubic feet of natural gas added for Alaskan North Slope.

## PROVED RESERVES (LIQUID HYDROCARBONS AND NATURAL GAS)

Dec. 31	Liquid hydrocarbons (million barrels)			Natural gas (trillion cubic feet)	Reserve/production ratio		
	Crude oil	Gas liquids	Total liquids		Crude oil	Total liquid	Natural gas
1953	28,945	5,438	34,383	210.3	12.5	13.2	22.9
1954	29,561	5,244	34,805	210.6	13.1	13.6	22.5
1955	30,012	5,439	35,451	222.5	12.4	12.8	22.1
1956	30,435	5,902	36,337	236.5	11.9	12.5	21.8
1957	30,300	5,687	35,987	245.2	11.8	12.4	21.4
1958	30,536	6,204	36,740	252.8	12.9	13.5	22.1
1959	31,719	6,522	38,241	261.2	12.8	13.3	21.1
1960	31,613	6,816	38,429	262.3	12.8	13.2	20.1
1961	31,786	7,049	38,835	266.3	12.6	13.0	19.9
1962	31,389	7,312	38,701	272.3	12.3	12.8	20.0
1963	30,970	7,674	38,644	276.2	11.9	12.4	19.0
1964	30,991	7,747	38,738	281.3	11.7	12.2	18.3
1965	31,352	8,024	39,376	286.5	11.7	12.1	17.6
1966	31,452	8,329	39,781	289.3	11.0	11.5	16.5
1967	31,377	8,614	39,991	292.9	10.3	10.9	15.9
1968	30,707	8,598	39,305	287.4	9.8	10.3	14.8
1969	29,632	8,143	37,775	275.1	9.3	9.6	13.3
1970 <sup>1</sup>	29,401	7,703	37,104	264.7	8.8	9.1	12.1
1971 <sup>1</sup>	28,463	7,304	35,767	252.8	8.7	8.9	11.5
1972 <sup>1</sup>	26,739	6,787	33,526	240.1	8.1	8.3	10.7

<sup>1</sup> Excludes 9,600,000,000 barrels of crude oil and 26 trillion cubic feet of natural gas added for Alaskan North Slope.

## PRODUCTIVE CAPACITY (CRUDE OIL AND NATURAL GAS LIQUIDS)

[In thousands of barrels daily]

Dec. 31	Productive capacity			Crude oil capacity		
	Crude oil	Gas liquids	Total	Yearly change	Spare	Percent spare
1953	7,926	744	8,670		1,583	20.0
1954	8,442	778	9,220	+516	1,635	19.4
1955	8,929	825	9,754	+487	1,778	19.9
1956	9,250	850	10,100	+321	2,080	22.5
1957	9,493	880	10,373	+243	2,783	29.3
1958	9,656	930	10,586	+163	2,603	27.0
1959	9,708	967	10,675	+52	2,673	27.5
1960	9,892	1,041	10,933	+184	2,709	27.4
1961	10,081	1,049	11,130	+189	2,749	27.3
1962	10,169	1,090	11,259	+88	2,627	25.8
1963	10,286	1,177	11,463	+117	2,672	26.0
1964	10,534	1,222	11,756	+248	2,730	25.9
1965	10,743	1,281	12,024	+209	2,448	22.8
1966	11,050	1,405	12,455	+307	2,240	20.3
1967	11,218	1,488	12,706	+168	2,122	18.9
1968	11,137	1,586	12,723	-81	1,899	17.1
1969	11,013	1,676	12,689	-124	1,376	12.5
1970	10,794	1,760	12,554	-219	1,331	12.3
1971	10,246	1,789	12,035	-519	692	6.8

## OIL SUPPLY (DOMESTIC PRODUCTION AND TOTAL IMPORTS)

[In thousands of barrels daily]

Year	Domestic production			Imports		Total
	Crude oil	Gas liquids	Total	Total	Percent of supply	
1953	6,458	655	7,113	1,034	12.7	8,147
1954	6,343	692	7,035	1,052	13.0	8,087
1955	6,807	772	7,579	1,248	14.1	8,827
1956	7,151	801	7,952	1,436	15.2	9,388
1957	7,170	809	7,979	1,574	16.4	9,553
1958	6,710	808	7,518	1,700	18.3	9,218
1959	7,053	880	7,933	1,780	18.2	9,713
1960	7,035	930	7,965	1,815	18.3	9,780
1961	7,183	991	8,174	1,917	18.7	10,091
1962	7,332	1,021	8,353	2,082	19.6	10,435
1963	7,542	1,098	8,640	2,123	19.4	10,763
1964	7,614	1,155	8,769	2,258	20.1	11,027
1965	7,804	1,210	9,014	2,468	21.1	11,482
1966	8,295	1,284	9,579	2,573	20.8	12,152
1967	8,810	1,410	10,220	2,537	19.4	12,757
1968	9,096	1,503	10,599	2,840	20.6	13,439
1969	9,238	1,589	10,827	3,166	22.1	13,993
1970	9,637	1,660	11,297	3,419	22.7	14,716
1971	9,463	1,692	11,155	3,926	26.0	15,081
1972	9,451	1,729	11,180	4,741	29.8	15,921

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## TOTAL IMPORTS

[In thousands of barrels daily]

Year	Crude oil	Light products	Sub-total	Residual fuel	Total imports	Percent of total domestic production
1953	648	26	674	360	1,034	14.5
1954	656	42	698	354	1,052	15.0
1955	782	49	831	417	1,248	16.5
1956	934	57	991	445	1,436	18.1
1957	1,023	76	1,099	475	1,574	19.7
1958	953	248	1,201	499	1,700	22.6
1959	966	204	1,170	610	1,780	22.3
1960	1,015	163	1,178	637	1,815	22.8
1961	1,045	206	1,251	666	1,917	23.5
1962	1,126	232	1,358	724	2,082	24.9
1963	1,131	245	1,376	747	2,123	24.6
1964	1,198	252	1,450	808	2,258	25.7
1965	1,238	286	1,524	944	2,468	27.4
1966	1,225	316	1,541	1,032	2,573	26.9
1967	1,128	324	1,452	1,085	2,537	24.8
1968	1,290	430	1,720	1,120	2,840	26.8
1969	1,409	492	1,901	1,265	3,166	29.2
1970	1,324	567	1,891	1,528	3,419	30.3
1971	1,681	662	2,343	1,583	3,926	35.2
1972	2,216	783	2,999	1,742	4,741	42.4

## TOTAL IMPORTS (BY COUNTRY OF ORIGIN)

[In thousands of barrels daily]

Year	Western Hemisphere				Eastern Hemisphere			Eastern Hemisphere total
	Canada	Venezuela	Other	Western Hemisphere total	Mideast	Africa	Other	
1953	8	451	311	770	226		38	264
1954	8	476	312	796	219		37	256
1955	48	547	344	939	277		32	309
1956	123	638	349	1,170	290		36	326
1957	159	754	353	1,266	244		64	308
1958	87	699	469	1,255	361	9	75	445
1959	161	781	473	1,355	350	5	70	425
1960	122	832	445	1,399	332	5	79	416
1961	193	815	491	1,499	344	7	67	418
1962	250	906	505	1,661	315	31	75	421
1963	265	900	558	1,723	303	31	66	400
1964	299	934	584	1,817	317	54	70	441
1965	323	995	651	1,969	360	69	70	499
1966	384	1,018	674	2,076	318	87	92	497
1967	450	937	757	2,144	209	59	125	393
1968	507	886	871	2,204	219	159	198	576
1969	608	875	999	2,482	193	229	262	684
1970	766	990	1,102	2,858	184	127	250	561
1971	857	1,019	1,195	3,071	378	204	267	849
1972	1,108	960	1,331	3,399	473	500	369	1,342

## CONSUMPTION

Year	Petroleum demand (thousands of barrels per day)			Percent U.S. energy consumption		
	Domestic	Export	Total	Liquid petroleum	Natural gas (dry)	Total
1953	7,624	401	8,025	42.7	21.6	64.3
1954	7,784	355	8,139	44.3	23.5	67.8
1955	8,493	368	8,861	43.8	23.1	66.9
1956	8,822	430	9,252	44.4	23.4	67.8
1957	8,860	568	9,428	44.4	24.8	69.2
1958	9,146	276	9,422	45.0	26.5	71.5
1959	9,494	255	9,759	45.3	27.6	72.9
1960	9,807	202	10,009	44.8	28.9	73.7
1961	9,985	174	10,159	44.9	29.0	73.9
1962	10,410	168	10,578	44.6	29.5	74.1
1963	10,753	208	10,961	44.2	29.8	74.0
1964	11,032	202	11,234	43.5	30.3	73.8
1965	11,523	187	11,710	43.6	30.2	73.8
1966	12,095	198	12,293	43.2	30.9	74.1
1967	12,569	307	12,876	43.5	31.3	74.8
1968	13,404	231	13,635	43.8	31.7	75.5
1969	14,148	233	14,381	43.7	32.4	76.1
1970	14,709	259	14,968	44.0	32.8	76.8
1971	15,225	224	15,449	44.4	33.2	77.6
1972	16,366	223	16,589	45.5	32.3	77.8

## GAS SUPPLY AND PRICE

Year	Supply (billion cubic feet)			Prices (cents per thousand cubic feet)		
	Production	Imports		Total	Current cents	Constant 1972 cents
		Total	Percent of supply			
1953	8,397			8,397	9.2	15.2
1954	8,742			8,742	10.1	16.4
1955	9,405			9,405	10.4	16.7
1956	10,064			10,064	10.8	16.8
1957	10,680	38	0.4	10,718	11.3	16.9
1958	11,030	136	1.2	11,166	11.9	17.4
1959	12,046	134	1.1	12,180	12.9	18.5
1960	12,771	156	1.2	12,927	14.0	19.8
1961	13,254	219	1.6	13,473	15.1	21.1
1962	13,877	401	2.8	14,278	15.5	21.4
1963	14,747	406	2.7	15,153	15.8	21.5
1964	15,462	442	2.8	15,904	15.4	20.6
1965	16,040	457	2.8	16,497	15.6	20.5
1966	17,207	480	2.7	17,687	15.7	20.1
1967	18,171	564	3.0	18,735	16.0	19.8
1968	19,322	652	3.3	19,974	16.4	16.9
1969	20,698	727	3.4	21,425	16.7	19.0
1970	21,920	821	3.6	22,741	17.1	18.4
1971	22,493	935	4.0	23,428	18.2	18.8
1972	22,910	1,307	5.4	24,217	19.5	19.5

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## PRICES

Year	Crude oil at well (per barrel)			Motor gasoline retail (cents per gallon)		
	Current dollars	Constant 1958 dollars	Constant 1972 dollars	Excise tax	Taxes	Total
1953	2.68	3.03	4.42	21.28	7.41	28.69
1954	2.78	3.10	4.52	21.56	7.48	29.04
1955	2.77	3.05	4.45	21.42	7.65	29.07
1956	2.79	2.97	4.33	21.57	8.36	29.93
1957	3.09	3.17	4.63	22.11	8.85	30.96
1958	3.01	3.01	4.39	21.47	8.91	30.38
1959	2.90	2.85	4.16	21.18	9.31	30.49
1960	2.88	2.79	4.07	20.99	10.14	31.13
1961	2.89	2.76	4.03	20.53	10.23	30.76
1962	2.90	2.74	4.00	20.36	10.28	30.64
1963	2.89	2.70	3.93	20.11	10.31	30.42
1964	2.88	2.65	3.86	19.98	10.37	30.35
1965	2.86	2.58	3.76	20.71	10.46	31.17
1966	2.88	2.53	3.69	21.57	10.51	32.08
1967	2.91	2.47	3.61	22.55	10.60	33.15
1968	2.94	2.40	3.51	22.93	10.78	33.71
1969	3.09	2.41	3.51	23.85	10.99	34.84
1970	3.18	2.35	3.43	24.55	11.14	35.69
1971	3.39	2.39	3.49	25.24	11.24	36.48
1972	3.39	2.32	3.39	24.46	11.67	36.13

## PRICE AND COST INDEXES

[1967 equals 100]

Year	Wholesale prices			Retail prices		
	Crude oil	Refined products	All commodities	Gasoline (ex. tax)	Gasoline (incl. tax)	All items
1963	98.7	95.1	94.5	89.2	91.8	91.7
1964	98.3	90.7	94.7	88.6	91.6	92.9
1965	98.2	93.8	96.6	91.8	94.0	94.5
1966	98.9	97.4	99.8	95.7	96.8	97.2
1967	100.0	100.0	100.0	100.0	100.0	100.0
1968	100.8	98.1	102.5	101.7	101.7	104.2
1969	105.2	99.6	106.5	105.8	105.1	109.8
1970	106.1	101.1	110.4	108.9	107.7	116.3
1971	113.2	106.8	113.9	111.9	110.0	121.3
1972	113.8	108.9	119.1	108.5	109.0	125.3

Year	Cost indexes (1967 equals 100)			Drilling costs		
	Oil field machinery	Oil well casing	Oil field wages	Total (thousands)	Per well	Per foot
1963	93.3	88.9	89.8	2,302,864	55,023	\$12.69
1964	94.8	91.9	90.8	2,427,367	55,820	12.86
1965	95.2	96.2	93.2	2,401,437	60,648	13.44
1966	96.5	96.2	96.3	2,360,740	68,386	14.95
1967	100.0	100.0	100.0	2,299,178	72,903	15.97
1968	106.4	101.2	104.0	2,409,360	81,463	16.83
1969	112.7	104.5	110.5	2,610,671	88,554	17.56
1970	118.4	109.1	117.8	2,578,682	94,885	18.84
1971	122.6	120.7	128.0	2,371,492	94,708	10.03
1972	127.3	128.4	136.7	NA	NA	NA



## COMPOSITE VALUE AND PRICE OF OIL AND GAS

Year	Value at wellhead (million dollars)			Natural gas price (per barrel)	Composite price oil and gas (per barrel)	
	Crude oil	Natural gas	Total		Current dollars	Constant 1972 dollars
1954	6,425	883	7,308	.54	1.86	3.03
1955	6,870	978	7,848	.56	1.86	2.99
1956	7,297	1,084	8,381	.58	1.87	2.90
1957	8,079	1,202	9,281	.61	2.02	3.02
1958	7,380	1,317	8,697	.64	1.94	2.83
1959	7,473	1,557	9,030	.70	1.88	2.70
1960	7,420	1,790	9,210	.76	1.86	2.63
1961	7,566	1,996	9,562	.81	1.88	2.62
1962	7,769	2,145	9,914	.84	1.89	2.60
1963	7,966	2,328	10,294	.85	1.88	2.56
1964	8,017	2,387	10,404	.83	1.84	2.47
1965	8,147	2,495	10,642	.84	1.83	2.41
1966	8,727	2,703	11,430	.85	1.82	2.33
1967	9,375	2,899	12,274	.86	1.87	2.32
1968	9,795	3,169	12,964	.88	1.88	2.24
1969	10,427	3,456	13,883	.90	1.93	2.19
1970	11,174	3,746	14,920	.92	1.97	2.12
1971	11,693	4,097	15,790	.98	2.07	2.13
1972	11,700	4,500	16,200	1.05	2.10	2.10

## FINANCIAL DATA

Year	Rate of return (percent)			Exploration and development outlays (Million dollars)		
	U.S. oil companies	All manufacturing companies	Total	Large companies	Independents	Total
1953	11.8	10.5	2,104	1,961	3,975	
1954	9.8	9.9	2,180	2,120	4,300	
1955	10.2	12.6	2,383	2,292	4,675	
1956	10.5	12.3	2,621	2,454	5,075	
1957	10.1	10.9	2,673	2,427	5,100	
1958	7.2	8.6	2,241	1,984	4,225	
1959	8.5	10.4	2,455	1,895	4,350	
1960	8.8	9.2	2,412	1,788	4,200	
1961	8.7	8.9	2,417	1,583	4,000	
1962	8.8	9.8	2,848	1,577	4,425	
1963	9.8	10.3	2,452	1,673	4,125	
1964	10.1	11.6	2,817	1,633	4,450	
1965	11.3	13.0	2,847	1,363	4,210	
1966	12.3	13.4	2,990	1,260	4,250	
1967	12.6	11.7	3,212	1,153	4,365	
1968	12.2	12.1	4,087	1,303	5,390	
1969	10.9	11.5	3,768	1,482	5,250	
1970	9.9	9.3	3,119	1,665	4,775	
1971	9.3	9.7	2,740	1,160	3,900	
Average 1952-71	10.2	10.8	2,707	1,727	4,434	

## APPENDIX D

## ADDRESS BY RUSSELL B. LONG ON MARCH 26, 1959, ON THE MANDATORY OIL IMPORT PROGRAM—MANDATORY CONTROL OF OIL IMPORTS

The PRESIDING OFFICER. Is there further morning business? If not, morning business is closed, and the Chair recognizes the Senator from Louisiana [Mr. LONG].

Mr. LONG. Mr. President, today I should like to expand upon my remarks of March 20 concerning the program which has recently been put into effect which provides for a mandatory system for the control of imports of petroleum and petroleum products into the United States. I ask unanimous consent that, in the event there are any interruptions in the course of my remarks, they be printed immediately following my address in the RECORD, and, furthermore that insertions I have prepared may appear in the RECORD at the appropriate place.

The PRESIDING OFFICER. Without objection it is so ordered.

Mr. LONG. Mr. President on March 10 the President of the United States issued a proclamation to regulate the imports of oil and its principal products into the United States. The basis for the President's action was legislation passed last year by the Congress, the so-called defense amendment, section 8 of the Trade Agreements Extension Act, which amends the Reciprocal Trade Act to read as follows:

"SEC. 2. \* \* \*

"(b) Upon request of the head of any Department or Agency, upon application of an interested party, or upon his own motion, the Director of the Office of Defense and Civilian Mobilization \* \* \* shall immediately make an appropriate investigation \* \* \* to determine the effects on the national security of imports of the article which is the subject of such request, application, or motion. If, as a result of such investigation, the Director is of the opinion that the said article is being imported into the United States in such quantities or under such circumstances as to threaten to impair the national security, he shall promptly so advise the President, and, unless the President determines that the article is not being imported into the United States in such quantities or under such circumstances as to threaten to impair the national security as set forth in this section, he shall take such action, and for such time, as he deems necessary to adjust the imports of such article and its derivatives so that such imports will not so threaten to impair the national security.

"(c) For the purpose of this section, the Director and the President shall, in the light of the requirements of national security and without excluding other relevant factors, give consideration to domestic production needed for projected national defense requirements, the capacity of domestic industries to meet such requirements, existing and anticipated availabilities of the human resources, products, raw materials, and other supplies and services essential to the national defense, the requirements of growth of such industries and such supplies and services including the investment, exploration, and development necessary to assure such growth, and the importation of goods in terms of their quantities, availabilities, character, and use as those affect such industries and the capacity of the United States to meet national security requirements. In the administration of this section, the Director and the President shall further recognize the close relation of the economic welfare of the Nation to our national security, and shall take into consideration the impact of foreign competition on the economic welfare of individual domestic industries; and any substantial unemployment, decrease in revenues of Government, loss of skills or investment, or other serious effects resulting from the displacements of any domestic products by excessive imports shall be considered, without excluding other factors, in determining whether such weakening of our internal economy may impair the national security."

At the time when the amendments of 1958 were being considered, the defense amendment of 1955 was already in effect. The 1955 amendment gave the President far more discretion than the 1958 amendment. Even under the 1955 amendment, however, the President's Cabinet Committee had already determined that an adequate domestic petroleum industry was essential to national defense and that the ratio of exports to imports prevailing in 1954 was the desirable level.

A voluntary control program was in effect in 1958 with the understanding that a mandatory program would be necessary if the voluntary program failed to achieve its objective.

It was understood in the House of Representatives that the defense amendment which they wrote into the act before the bill came to the Senate was designed for just such a situation as existed in the petroleum industry.

I should like to call the attention of the Senate to a colloquy between the chairman of the Ways and Means Committee of the House of Representatives, the Honorable Wilbur Mills, and the Member of Congress from the 13th District in Texas, the Honorable Frank Ikard, on June 10, 1958, on the defense amendment.

Let me quote from this colloquy:

"Mr. IKARD. Mr. Chairman, I would like to ask the distinguished chairman of the committee two or three questions.

"Is it a fact that the so-called national security section of the committee bill has as its purpose providing the executive department with a means of taking whatever action is necessary to avoid a threat to our national security through imports and to make such \* \* \* that injury to a particular industry essential to the national security will be avoided?"

"Mr. MILLS. The answer is 'Yes'.

"Mr. IKARD. Is it a fact that the national security amendment of the present law was amended by the committee as reflected in the committee bill for the purpose of improving and facilitating the operation of this provision by providing specific criteria and guidelines for use in its administration?"

"Mr. MILLS. The answer to that question is 'Yes.'"

"Mr. IKARD. The national security section of the committee bill specifies certain factors which would govern the Director of the Office of Defense Mobilization and the President in determining whether imports are a threat to national security. These are stated in the committee bill substantially as follows:

"The Director and the President shall \* \* \* give consideration to domestic production needed for projected national defense requirements, the capacity of domestic industries to meet such requirements, existing and anticipated availability \* \* \* products, raw materials and other supplies and services essential to the national defense, the requirements of growth of such industries and such supplies and services including the investment, exploration, and development necessary to assure such growth, and the importation of goods in terms of their quantities, availabilities, character, and use as those affect such industries and the capacity of the United States to meet national security requirements."

"Mr. IKARD. I am interested in knowing how these criteria would relate to the problem of excessive imports of petroleum and petroleum products. It is intended that under this provision imports of petroleum and petroleum products be held at levels which would permit the domestic industry to engage in a vigorous program of exploration at a rate consistent with the demands of our economy?"

"Mr. MILLS. This provision is intended to hold imports at a level which will permit the United States to have sufficient oil, known, discovered, and developed as is required to meet our national security needs.

"Mr. IKARD. Does the committee amendment that will be offered to the national security section of the committee bill dealing with investment, exploration, and development necessary to assure the proper growth of an industry have any significance to the petroleum industry and other extractive industries?"

"Mr. MILLS. Yes. This amendment will be offered to the bill for the purpose of further clarifying the committee's intentions with respect to encouraging free enterprise, exploration for, and the development of our natural resources at a rate sufficient to meet the demands of our national security. If drilling and exploration activities do not reach a satisfactory level, then under this provision the President or his designate would have the responsibility of re-evaluating existing programs for the regulation and control of imports to see that they meet the requirements of the new standards in the committee bill.

"Mr. IKARD. In the case of petroleum, is it intended that if the pending committee bill becomes law that a new study and certification would be necessary?"

"Mr. MILLS. The answer is "No." I refer the gentleman specifically to the language on page 17, lines 15 to 17, which he offered in the committee to guarantee that the answer would be "No."

"Mr. IKARD. Is it intended that when the imports of a natural resource are controlled under the provisions of the national security section of the committee bill, and with particular reference to petroleum, that such control should take into consideration the importation of products, derivatives, or residues of petroleum so that these products and derivatives could not be imported in a way that would circumvent the control of the imports of the basic natural resources?"

"Mr. MILLS. Yes. Clearly, when a decision is taken to restrict imports in the interest of national security it is our intention that the decision be effective and not rendered ineffective by circumvention."

Under these circumstances, it is difficult for anyone who supported the defense amendment of 1958 to conceive how anyone could possibly argue he did not understand that the defense amendment of 1958 would require greater protection of the domestic petroleum industry. Certainly, those of us who served on the Finance Committee explored this matter very carefully when the Secretary of Commerce testified before the committee.

Much of the language which went beyond the 1955 amendment was drafted with the petroleum industry specifically in mind. While there is no transcript of the executive session before the Committee on Finance, I am certain that every member of the committee recalls distinctly that the relationship of the amendment to the petroleum industry was thoroughly discussed when the committee considered this matter.

The Senate Finance Committee broadened the language of the House bill to strengthen the defense amendment. I should like to quote from the committee report on this measure:

"The Finance Committee accepted the section of the House bill relating to the national security, but amended it for the express purpose of strengthening and increasing its effectiveness. As was the purpose when the national security section was added in the 1955 extension of the act, the amendments are designed to give the President unquestioned authority to limit imports which threaten to impair defense-essential industries. Section 8 of the bill as reported grants to the President a potentially fast-moving vehicle for guarding our national security in this respect.

"The bill as reported provides that imports of an article, or its derivatives, must be adjusted unless the President finds that they are not entering in such volume as to threaten the national security, after the Director of the Office of Defense Mobilization has indicated such a threat exists. Language was further added directing attention and providing possible action whenever danger to our national security results from a weakening of segments of the economy through injury to any industry, whether vital to the direct defense or a part of the economy providing employment and sustenance to individuals or localities. The authority of the President is thereby broadened considerably, but the dangers inherent in an economy suffering from unemployment, declining Government revenue, or loss of skills, and investment because of excessive imports of one or more commodities, must be recognized and avenues provided whereby they may be lessened."

No one can read the legislative history of this amendment and have any doubt that such a mandatory program is exactly what was intended by the bill.

Mr. President, the problem of excessive imports of our fuel supplies has not been of concern only to the oil industry. Our coal producers supply much of our domestic fuel needs and have been having an extremely difficult time as well. The order placing residual fuel oil on the quota list should help revive that industry so vital to our national well-being and to the economies of certain sections of our country.

The President has not been hasty in responding to the duty that Congress has imposed upon him to limit oil imports. Many distinguished Members of this body have been urging the administration to take this action for some time as it has become increasingly apparent to us that the domestic industry, so vital to our whole economy, has been driven into a dangerously low level of production and exploratory activity.

Last year I felt it necessary to introduce an amendment which would require the President to limit the amount of foreign oil that could be brought into this country. I did not bring this amendment to a vote because I was assured that the defense amendment was designed to meet the problem.

In issuing the proclamation establishing the mandatory control program, the President said:

"The new program is designed to insure a stable, healthy industry in the United States capable of exploring for and developing new hemisphere reserves to replace those being depleted. The basis of the new program, like that for the voluntary program, is the certified requirements of our national security which make it necessary that we preserve to the greatest extent possible a vigorous, healthy petroleum industry in the United States."

It has been contended by some that the national security argument is specious. I do not see how anyone who is aware of the facts of the case can make such a statement, especially in view of the position of the Commander in Chief of our Armed Forces and the Special Committee To Investigate Crude Oil Imports,

composed of the following Cabinet members: John Foster Dulles, Secretary of State; Neil H. McElroy, Secretary of Defense; Robert B. Anderson, Secretary of the Treasury—former Assistant Secretary of Defense, former Secretary of the Navy; Fred A. Seaton, Secretary of the Interior; James P. Mitchell, Secretary of Labor; Lewis L. Strauss, Secretary of Commerce—also rear admiral, retired, former Chairman of the Atomic Energy Commission.

On March 6, this special committee recommended the voluntary import program be replaced by a mandatory program. In their report to the President, they said:

“On February 27, 1959, the Director, Office of Civil and Defense Mobilization, reported to you that crude oil and its principal derivatives were being imported into the United States in amounts which threaten to impair the national security. In the light of that finding, the special committee recommends that the voluntary oil import program be replaced by a mandatory program which will limit the imports of crude oil and certain derivatives to such levels as the national security requires and will allocate such imports as are authorized among companies in a fair and equitable manner.”

Mr. President, those who argue that it is not necessary to the security of the United States that we have a healthy domestic oil industry capable of rapidly expanding its production in time of emergency must be of the school who believe that any future wars will be of the pushbutton nuclear type.

Apparently they rely upon statements of some of our military leaders that a thermonuclear war would cause such devastation that the outcome would be decided within 72 hours. From this statement they reason that the ability to fight a long, protracted war is no longer necessary. Hence, they suggest that there is no real need to maintain a domestic oil industry of any real magnitude.

If the gentlemen are correct, what we say and do here will make little difference one way or another. If there is such a nuclear conflict, utilizing all of the weapons that have recently been developed whose destructive power is almost beyond comprehension the best that we could hope for is that possibly 60 million of the enemy would be destroyed while only 15 million or 20 million of our own would be lost. We might be able to completely destroy the enemy's warmaking potential, with our losses limited to perhaps 10 percent of our population. On the other hand, it is conceivable, and some say that it is highly probable, that civilized man would be completely eradicated from the face of the planet in such a holocaust.

Now, let us analyze that logic for a minute. Have any of the military leaders ever said that we do not need to have a domestic fuel industry adequate for our needs? Not at all. Have any of our military leaders suggested that we should not be able to fight a limited war with conventional weapons? Not that I know of.

Quite the contrary. Gen. Maxwell Taylor, the Chief of Staff of the U.S. Army, and Adm. Arleigh Burke, our Chief of Naval Operations, both state clearly that while we must stay prepared for a nuclear war, it is much more likely that the hostilities in which we will be engaged will continue to be wars of a limited nature.

Since World War II, there have been 18 wars of various sizes. Atomic weapons have not been used in any of them. Some of those wars were large and extremely significant. So was the result of the military decision.

Among them were the civil war leading to Communist victory in China, the war in Korea, the war in Indochina, the revolutions in Indonesia, the fighting in Greece, the warfare in the Near East, and the revolution in Hungary.

During the Suez crisis we had a good indication of the importance of a dependable supply of oil. England and France were frantic. They were fighting to protect their lifeline to the oil in the Near East. In England gasoline was rated to approximately 7 gallons per month. Gasoline reserves were rapidly depleted in France.

It was the United States with its surplus productive capacity which was able to maintain a position of strength and confidence. We were able to go to the aid of our friends with large quantities of surplus oil and forgo imports from abroad at the same time.

It is because we wish it that way that we are constantly called upon to shoulder the heavy end of the load. Yet the truth is that aside from the oil in the United States, the free world is in a very vulnerable position insofar as its fuel requirements are concerned.

This is especially true of all of our allies in Europe, Australia, New Zealand, and even Japan. In the event of an emergency that disrupted the oil supply from Venezuela, the Middle East, and Indonesia, over 368 million people who are our allies would be dependent upon us for oil.

It would be extremely dangerous and unwise to permit our domestic oil industry to wither away as a result of foreign oil imports until we were no longer able to provide even our own requirements in an emergency.

We know that the Government of Venezuela is friendly as of today but the reception given our Vice President and his wife by Communist sympathizers is enough to put us on notice that the situation there could change overnight.

I do not think our friends from New England would like to be completely dependent upon the Middle East for fuel oil to keep them warm on cold winter nights. We all are familiar with the conflicts and the basic instability of that part of the world at present. With Nasser, Kassem, and Khrushchev all vying for supremacy, that source could be denied us at any time.

It is difficult to see how anyone fully aware of the facts could deny that a healthy oil industry is vital to our national security.

Recently a shipment of Rumanian oil reached the United States. Russia is now exporting large quantities of oil to certain areas in Europe and Iceland. I certainly hope that those opposed to a strong oil-producing industry in America are not so foolish as to believe that we might be able to import Rumanian and Russian oil in time of crisis.

#### PROBLEM OF MAINTAINING ADEQUATE CAPACITY

Those of us who understand the petroleum business are frequently confronted with opponents whose arguments have so little foundation in fact that we have a hard time even understanding what they are trying to say. For example, I have found people who would presume to express an opinion about the subject who are under the impression that an industry with proved reserves adequate to last 15 years should be able to produce all those reserves in 4 or 5 years to meet an emergency. This fails to take into account the actual facts of the situation.

If a well is pulled too hard, the ability of the well to drain oil from the sand where it is usually located is destroyed. Most oil is found in a strata of sand or shale on top of an almost inexhaustible supply of salt water. If pulled too rapidly for good conservation purposes, the salt water will be drawn into the pipe, and it may be a long time before oil can be produced from the well again. In some cases the well will be permanently killed.

In other cases the pressure of gas above the oil is required to force the oil to the surface. The principle of this operation is like a seltzer-water bottle, in which the gas is above the water and a tube extends from the mouth of the bottle into the water. The gas pressure pushes down on the water, forcing it up the tube and out of the bottle. In the case of an oil well, if the oil is extracted too rapidly, the gas will be exhausted too quickly, thereby forcing the use of a pump to lift the oil.

Another method of getting oil to the surface is called water flooding. In a field where there is no gas pressure, water is pumped into a well. The oil floats above the water, making it possible to lift the oil by pumping or flowing it slowly.

No matter what method is used, only a certain amount of oil can be taken from the ground each day without reducing the capacity to produce that which could otherwise be recovered.

The present capacity of the industry is somewhat greater than 10 million barrels per day, compared to about 7 million domestic production and 9 million domestic consumption.

In addition to the heavy losses suffered by trying to produce oil too quickly from a well, there must be sufficient transportation facilities to carry the oil to the refineries where it is turned into the petroleum products that are needed. Oil must be carried by pipeline, by water, or by the railroads. A tremendous increase in domestic production would dislocate existing transportation facilities, and if the domestic industry were to be further curtailed, transportation facilities would not be adequate to meet an emergency increase in domestic production. Transportation difficulties became a very serious problem when the industry was called upon to expand its production during the Suez crisis.

On March 6, 1959, the above ground crude oil stocks of the United States were estimated at 256 million barrels and petroleum product stocks were estimated at 488 million barrels. The National Petroleum Council estimates that only 30.1 percent of the crude oil stocks are readily available and only 65 percent of the product stocks, the rest being the fill in pipelines necessary to insure a smooth flow, and in the bottom of storage tanks. Available crude oil is estimated at 77 million barrels, and available products are estimated at 314,894,000 barrels. Thus, we have approximately a 10-day supply of available crude above ground and a 30-day supply of products. This is not enough to carry us very far in case of an emergency.

It might be asked. Why not store more above ground where it is readily available? This suggestion runs afoul two objections. First, because it is wasteful due

to evaporation; and second, because of the excessive cost of tank storage. It costs approximately \$2 per barrel to store oil above ground. To store a 10-day supply of 70 million barrels costs about \$140 million, not including the cost of the loss due to evaporation, which would be considerable if the oil has to be stored for a long period. It is far more efficient and economical to keep the oil in the ground, and to maintain at all times a sufficient number of wells capable of stepping up production without undue loss.

#### WE ARE NOT RUNNING OUT OF OIL

Several Senators have recently taken the floor to argue that it would be far better to save our own oil and import all the oil we can get, husbanding our own supplies for an emergency.

This is the fallacious idea that the domestic petroleum industry has had to contend with since shortly after it was founded just 100 years ago this year. The fact that the domestic industry is 100 years old and today is stronger in terms of reserves in the ground than at any time in its history, is proof of that.

I would like to cite a few examples of oil prophecies of the past which claimed the hour of extinction was at hand and show the progress of the domestic oil-producing industry despite these forecasts of doom.

First. In 1891, just 32 years after the first well was drilled successfully, the U.S. Geological Survey stated there was little or no chance for oil to be found in Kansas or Texas. In reality, more than 25 billion barrels of oil have been produced in these two States since that date.

Second. In 1914, an official of the U.S. Bureau of Mines stated that a total production of only 5.7 billion barrels of oil was possible in the United States. In reality, 56 billion barrels have been produced from 1914 to 1959.

Third. In 1947, the Chief of the Petroleum Division of the Department of State said sufficient oil cannot be found in the United States. From 1947 through 1958, 26 billion barrels of crude oil were produced and, in addition, 9 billion barrels were added to our known reserves.

Fourth. As late as 1949, the then Secretary of the Interior stated that the end of the U.S. oil supply was almost in sight. Since that date the domestic oil-producing industry has found more than 29 billion barrels of oil.

Today, total U.S. production is 7,100,000 barrels daily and the Nation's petroleum reserves are at an all-time high of 16 billion barrels.

In contrast to these earlier forecasts of the United States running out of oil, however, the U.S. Bureau of Mines, in a statement before the House Appropriations Subcommittee, recently set total U.S. recoverable crude oil reserves at 300 billion barrels under known recovery methods. This 300-billion-barrels figure refers to the so-called potential reserves which estimates the amount of oil that experience causes us to predict we can find and produce. This does not take into consideration increased efficiency in production or the development of better technology in the search for and development of domestic reserves.

Neither do these figures take into consideration the U.S. Geological Survey estimates of available oil from western shale deposits of more than 1 trillion barrels.

Thus, it should be apparent to all, that as long as we have oil producers in this country, we will have oil. The only essential for the next 1,000 years is the oil producer. He is the indispensable element.

This brings me to the final answer to the "running out of oil" song which those who would profit most by loosening a flood of foreign oil into this country sing so loudly.

Most of us here in the Senate are fairly well versed in the rudiments of economics. Thus, I think we can all understand that if a producer cannot sell his product, he soon goes out of business. The domestic oil producers do not have an inexhaustible supply of funds, despite what we may hear to the contrary. In order to go out and look for new oil fields, in order to drill the wells once he thinks he has found a possible producing area, he first must sell some of the oil he has found in the past. He must pay the debts he incurred while finding and producing his previous wells and still have enough money left over to look for more oil. He cannot do this if he cannot sell the oil he has already found.

That oil does him, the economy, or the national security very little good until it is produced, sold, and processed. And, believe me, Mr. President, the oil he has not found yet cannot do anyone any good. If you do not believe me, just ask the Indians.

It takes from 3 to 10 years to develop a large oil field into shape so that it would be available in time of need. Oil potentials are found and developed. They simply cannot be found nor developed overnight, as some would have you believe.

Some of my friends who complain about the necessity of insuring a healthy domestic petroleum industry remind me of the little pig who built his house of straw to keep the wolf away. They will share the benefits of our internal strength if, like the pig who built his house of brick, we insure our security by maintaining an adequate domestic fuel supply.

The more one explores the facets and problems of maintaining an adequate supply of fuel to meet whatever war or emergency this Nation might face, the more one is forced to the inescapable conclusion of the Special Cabinet Committee which follows:

"In summary, unless a reasonable limitation of petroleum imports is brought about, your Committee believes that: In the event of a serious emergency, this Nation will find itself years away from attaining the level of petroleum production necessary to meet our national security needs." (Taken from the report of the Special Committee To Investigate Crude Oil Imports, July 29, 1957.)

The Secretary of the Interior has correctly stressed the crucial necessity of finding and developing additional reserves as our existing reserves are depleted. He has pointed out that since 1956 the number of wells drilled has declined by approximately 16 percent. Senators will note that the defense amendment, for which they voted, placed particular stress upon just such factors. Once again I invite attention to the last paragraph of section 8 of the Trade Agreements Extension Act which I have previously quoted.

#### FOREIGN TRADE: THE DOLLAR GAP IS GONE

Apart from the needs of national defense, it would be well to consider our imports and exports in oil as compared to other aspects of our foreign trade. Let us separate some of the facts of the situation from the fiction and the myth that exist today.

In the first place, there is no longer any dollar shortage throughout the world. Perhaps there may be a shortage of dollars in a few countries, but in the world as a whole foreign dollar holdings now amount to more than \$16 billion. I first came to Washington in 1948. We were told that it was necessary to pass the Marshall plan to give away \$17 billion as a contribution to the economic reconstruction of Europe. It was contended at that time that Europe was not in a position, and could not be in the foreseeable future, to repay the dollars which she needed from us. We were told that it was necessary to close the dollar gap, which theoretically represents the difference between our exports and our imports from Europe.

Ten years later we find that every year since 1948 foreign nations have received more dollars from the United States than they have paid out. While it is true that an American is not entitled to demand payment in gold for his dollars, foreign nations and foreign businesses are in a position to demand gold payments.

Much of the dominant position of the United States in international commerce has been related to our ability to redeem our currency abroad by payment in gold. When the great hue and cry to close the dollar gap was raised in 1948, we then had at Fort Knox \$24,400 million, in round figures, worth of gold. Foreign nations held \$7,700 million, leaving us \$16,700 million in gold that we could call our own. By the end of 1958, our gold balance had declined to \$20,600 million, with foreign nations holding \$17,600 million, leaving us only \$3 billion in gold not subject to foreign claims. We were told that this is less than the bare minimum which it is necessary to keep on hand for the protection of our own currency within the United States. Therefore, the fact of the matter is that, when we look to the world as a whole, far from having a situation that requires that we place more of our dollar holdings in the hands of foreign nations, we have, in fact, just the opposite situation.

I am not saying that there are not a number of ways by means of which we can adjust our present situation in order to reverse the flow of our dollars to foreign nations. There are a number of expedients which we can use to protect our position; but, so long as we stick to present policies, we have depleted our gold reserves as far as we can afford.

One may ask how we came to be in such an unfavorable position on trade balances, when our exports have been exceeding our imports by more than \$6 billion a year. Much of the misunderstanding in this field has resulted from a failure of administration propagandists to tell the whole story. When they compute an export figure of \$17,800 million for 1958, compared to an import figure of \$12,800 million for the same period, they stop at that point, without telling the rest of the story.



The spokesmen for unlimited imports leave out of their calculations over \$3 billion of military expenditures overseas in payments for base rights and in payrolls of servicemen.

They overlook almost \$3 billion of direct aid to foreign governments.

They overlook \$3 billion annually of American investment in foreign countries.

They overlook the tourist expenditures of about \$1¼ billion annually going to citizens of foreign countries.

When all of these factors are taken into account, it is easy enough to see why our dollar is declining at the very time when we had been led to believe that we would be in better shape than ever.

Therefore, let us get this matter straight once and for all. There is no dollar shortage in any general sense. We are on the short end of payment balances. In a general sense, it is this Nation which owes the money, not the foreign countries.

#### MOST INDUSTRIES EXPORT MORE THAN THEY IMPORT

Now let us further analyze the nature of foreign imports into this country. Of \$12,800 million of foreign products imported into the United States last year, almost half of these products came in without any charge whatever for duty. These products were on the free list. For the most part they are not produced in the United States. I have in mind such products, as coffee, cocoa, bananas, industrial diamonds, various metals, ores, and newsprint.

When we add to the list of imports which come in duty-free the imports which industrial diamonds, various metals, ores, and newsprint.

When we add to the list of imports which come in duty-free the imports which are subject to duty, although they are not competitive with American products, such as chrome, nickel, manganese, and cut diamonds, we find that more than half of the products imported into the United States are not competitive with those produced here. With regard to that half of our imports, we are trading in the old and traditional sense, whereby a Nation imports the things it does not produce and cannot produce, and exports the things it produces in surplus. This much of our foreign-trade picture should be simple and relatively uncomplicated.

There is a second type of trade, which is generally accepted and favored by all nations. This is the kind of trade in which a nation imports a product which is not essential to the security of the importing nation and which has always been produced more cheaply by foreign nations.

The third category of imports are those which most nations prohibit. Those imports would have the effect of curtailing or destroying an established domestic industry. I have not been able to find a single instance, with the exception of the United States of America, in which a country has permitted one of its major industries to lose its domestic market, or even a significant portion of its domestic market. I am sure there must be instances in which this has resulted; yet I have challenged some of those who pose as experts in this field to cite me even one. Thus far they have not done so. It is certainly true in a general sense that every nation imposes tariffs and quotas or provides subsidies for its domestic industries before it permits them to be driven out by low-cost foreign competition. In the United States only 1½ percent of our gross national product, or 3 percent of our movable production, is represented by imported products which are competitive with American production.

In almost every major industry, our exports exceed our imports.

For example: Our Nation exports nearly five times as much in the field of chemicals and related products as it imports.

We export about 14 times as much industrial office and printing machine equipment as we import.

We export nearly four times as much in the scientific and professional instruments field as we import.

The automobile industry is an interesting example of foreign trade. At present, we import almost four times as many cars as we export. Yet, when we compare the total dollar volume of exports of automobiles, parts, and accessories, to the total volume of imports, we find that our exports are well over twice our imports.

The answer to these seemingly contradictory statistics in connection with the automobile industry is that almost three-fourths of the value of automobile exports is composed of component parts and trucks, which are produced in this country, but are assembled in other countries. Thus, we import more finished products, more complete automobiles; but we export far more in the way of semifinished automobiles.

In other words, except for sugar and wool, which industries are protected by special arrangements under law, every other American major industry, except the minerals and the paper industries, exports far more than it imports. This statement is even true of the textile industry as a whole, although certain segments of that industry do face stiff foreign competition.

Petroleum and petroleum products, therefore, constitute the principal industry unprotected by a firm arrangement in Federal law in which imports greatly exceed exports. In the petroleum industry, as I have said, the imports exceed exports by over five to one.

Mr. President, I would like to have printed at this point in the RECORD a table comparing imports to exports in certain industries.

There being no objection, the table was ordered to be printed in the RECORD, as follows:

## IMPORTS COMPARED TO EXPORTS

	Exports (millions of dollars)		Imports (millions of dollars)		Export-import ratio (approximate)
	January 1957	September 1958	January 1957	September 1958	
Petroleum and petroleum products.....	725.0	351.0	1,365.7	1,826.0	5- 1.0
Chemicals and related products.....	1,038.0	995.4	205.8	207.1	1- 5.0
Industrial, office, and printing machinery industry.....	1,950.8	1,813.7	151.9	131.6	1-14.0
Automobiles, parts and accessories.....	989.4	803.3	227.8	387.5	1- 2.0
Textile fibers and manufactures.....	1,322.0	1,013.2	753.7	668.5	2- 3.0
Photographic and projection goods.....	75.6	77.9	29.8	29.1	2- 5.0
Scientific and professional instruments...	77.0	75.3	21.2	20.5	1- 5.0

## PETROLEUM INDUSTRY ABSORBS FAR MORE THAN ITS SHARE OF IMPORTS

Mr. LONG. Mr. President, petroleum and petroleum products have accounted for a steadily declining percentage of total U.S. exports. At the same time oil has accounted for a steadily increasing share of total U.S. imports.

I would like to insert in the RECORD at this point, a table showing these contrasting trends.

There being no objection, the table was ordered to be printed in the RECORD, as follows:

	Exports of petroleum and products as percent of value of total exports of U.S. merchandise	Imports of petroleum and products as percent of total value of U.S. imports for consumption
Average, 1936-40.....	10.9	2.0
Average, 1941-45.....	5.8	2.7
Average, 1946-50.....	4.8	5.8
Average, 1951-56.....	4.7	7.3
Average, 1956 <sup>1</sup> .....	4.0	10.2
Average, 1957 <sup>1</sup> .....	4.8	12.0
Average, 1958.....	3.3	12.9

<sup>1</sup> Affected by Suez crisis.

Mr. LONG. In 1958, as is apparent from this table, oil accounted for 12.9 percent of the total dollar volume of U.S. imports. When it is realized that approximately half of these imports are not competitive with American goods, it is apparent that oil accounted for well over 25 percent of the dollar volume of all competitive imports.

The petroleum industry recognizes the important role of international trade. However, let us take a look at the relative position of oil in total U.S. foreign trade for 1957 and compare this with 1934, the year the trade agreement program was authorized. In 1934 oil imports were valued at about \$36 million, or 2 percent of the total value of all imports of all commodities. In 1957 these figures were \$1.5 billion, or 12 percent of this Nation's import trade. Obviously, oil has already contributed a substantial and increasing share of the total U.S. import trade. This one industry, so vital to national security, should not be expected to con-

tribute to increasing international trade beyond the point that endangers the maintenance of adequate domestic supplies.

This history shows that oil has more than done its part in encouraging world trade. To further the extent of contribution petroleum has made since 1939, the date of the original Venezuela agreement, total annual dollar value of petroleum imports has increased more than 35 times, from approximately \$40 million to about \$1.5 billion in 1957.

Comparing the first half of 1956 to the first half of 1958, we see that the production of crude oil in the United States dropped by 698,000 barrels daily, while production in the Middle East increased by 502,000 barrels daily and Venezuelan production increased 155,000 barrels daily. U.S. production was down 9.7 percent in this period, while Middle East production was up 13.9 percent, Venezuelan production up 6.6 percent. Far East production up 19.2 percent, and Canadian production up 4.6 percent.

The following chart shows changes in crude oil production from the first half of 1956 to the first half of 1958:

*Changes in crude oil production—1st-half 1958 versus 1st-half 1956*

	<i>Barrels daily</i>
Middle East.....	up.. 502, 000
Venezuela.....	up.. 155, 000
Far East.....	up.. 75, 000
Canada.....	up.. 20, 000
United States.....	down.. 698, 000
	<i>Percent</i>
Middle East.....	up.. 13. 9
Venezuela.....	up.. 6. 6
Far East.....	up.. 19. 2
Canada.....	up.. 4. 6
United States.....	down 9. 7

Mr. President, the importation of oil into the United States has increased tremendously in the last 5 years, as demonstrated by the next exhibit showing the source and amount of U.S. crude oil imports from 1954 through 1958:

SOURCE OF U.S. CRUDE-OIL IMPORTS

[Thousands of barrels per day]

Year	Canada	Venezuela	Other Western Hemisphere countries	Total Western Hemisphere imports	Eastern Hemisphere countries	Total
1954.....	7	352	47	406	251	656
1955.....	46	386	43	475	307	782
1956.....	117	456	42	615	319	934
1957.....	151	531	35	717	304	1, 622
1958.....	84	433	29	546	407	953

Most industries which face stiff foreign competition have the protection of tariffs. On goods which are protected, excluding oil, the average tariff is almost 15 percent ad valorem, compared to a tariff of approximately 3 percent in the case of oil.

In almost every case where imports of a product exceed the exports of that product there is a program to protect our domestic industry. Two examples of this are sugar and wool. The level of American production of these products is sustained by acts of Congress.

In 1958, our exports totaled \$17.9 billion, and our imports totaled \$12.8 billion. In 1957 our exports were valued at \$20.8 billion, while imports were valued at \$12.8 billion. Our imports have been roughly equal to two-thirds of our exports. Only half of the goods we import compete directly with American goods. Only about \$6.5 billion of our annual imports are competitive.

Thus we see that the average ratio of exports to all competitive imports for the last 2 years is approximately 3 to 1. Our exports are three times as large as our imports for American industry as a whole.

Compare this favorable ratio to the situation which exists in the oil industry, where we import over five times as much as we export. Is it not then apparent that the oil industry is already absorbing at least several times more than its fair share of the burden of foreign trade?

What other American industry and its workers would be willing to give 20 percent of their market to foreign imports, and lower their tariff to 3 percent, without the prospect of some sort of protection?

I should like to put my friends on notice that if their attitude concerning protection for an industry, which is so vital to our national security, is one of unrestricted free trade, we may require that they live by the same standards they set for us.

It should be emphasized that under the provisions of the defense amendment, the President has the power to raise as well as lower the import quotas. It is not a one way street. If any of the fears expressed by opponents of the program materialize, the President has the authority to increase the quota.

#### DOMESTIC PRODUCTION WILL PROTECT THE CONSUMER

Many fallacious arguments have been used in attacking the President's long-overdue action to regulate oil imports. It has been stated that the President's order is a major contribution to inflation.

The record of the oil producing industry refutes this statement. The domestic petroleum producing industry has been one of the least inflationary industries in the United States. Since December of 1947, crude oil prices have been adjusted upward in only two instances, once in June 1953 and again in January 1957. Both increases were nominal and insufficient to offset increasing costs. Since the last increase, prices have been eroded away until today in many of the oil producing areas of the United States the price is below what it was before January 1957.

In the latest 16 months, studies made by the Oil and Gas Journal indicate that oil producers have lost \$807,718 a day in income through crude price cuts, involving 5,487,200 barrels a day. During this time some crudes have sustained two price cuts.

Mr. President, the following table shows cuts in the price of crude oil, the amount of crude affected, and the total daily dollar loss to producers:

	Barrels per day	Amount of cut (cents)	Total loss
October 1957 to April 1958.....	1,945,000	13.1	\$250,000
May to October 1958.....	2,260,470	20.51	463,000
November 1958 to mid-January 1959.....	2,282,050	8.75	112,188

Mr. President, a few upward adjustments were made in this period which added \$17,470 to producers' income.

Since 1974, this industry has absorbed more than 11 general increases in the price of steel, which it uses by the millions of tons every year. Industry wage rates have increased on 10 occasions, and there have been increases in the price of all of its equipment from drill pipe to oilfield machinery.

We often hear complaints about the high price of gasoline at the service station. Yet today we pay only 2 percent more for gasoline—less taxes—than we did in 1926. It is true that since 1926 the tax on gasoline has increased 270 percent. The 2-percent increase in the price of gasoline is in contrast to a 63-percent increase in the consumer price index for all commodities during the same period. Nor does it take into account the tremendous improvement in the quality of the gasoline.

This history of the petroleum industry is persuasive argument that the consumers of this Nation will not be the victims of unreasonable price increases because of a very modest restriction placed upon the importation of foreign oil.

It would be well to keep in mind that imports had been steadily increasing until the President's order went into effect and inflation had increased tremendously during this period.

It has been mentioned in the Senate that New England has experienced an increase of about 2 cents per gallon in the price of fuel oil within the last few months. It was said that this was the result of the voluntary controls over the importation of oil.

In view of the fact that imports continued to increase until March 10, it is difficult to see how this raised the price of fuel oil. It is probable that the increase in fuel oil prices was due to the increase in transportation costs.

The increase in tank-wagon prices in four Midwestern States has been criticized. Let me say that a one-half cent per gallon increase is hardly worth commenting on in this regard. There are frequent price fluctuations in tank-wagon prices throughout the United States at all times. If there were not this price difference, it is likely that someone would contend that there was an industry monopoly and that the industry was not subject to competitive conditions.

Oddly enough, the price increase of the Standard Oil Co. of Indiana was that which was referred to. I should like to point out that this is one of the major oil importing companies which was not in favor of the mandatory program. When it was pointed out in the Senate that "these oil interests could not wait for the ink to get dry on the President's proclamation before they started raising prices," it might be said that, inasmuch as Standard Oil of Indiana was opposed to the mandatory program, they could have raised prices in order to discredit the program and make it appear as if it were responsible for what was actually a long-contemplated price increase.

The independents and other domestic producers would want this program to be popular, while the large importers might well want the program to be unpopular.

When critics of this program referred to the problem of increased unemployment, they could not be referring to the tens of thousands of oil field workers who will be put back to work, as a result of the President's program. As a matter of fact, a tabulation and estimate the junior Senator from Louisiana had made as to the effect of increased imports in Louisiana indicates that in Louisiana alone, which is not the largest producing State by any means, unemployment increased about 25,000 because of increased oil imports.

The increased production from domestic wells, which has long been producing at uneconomically low daily allowables, should help to hold down the price of oil.

Foreign imports do not tend to lower the price of oil—they merely lower American production. This is true because the importers own most of the refinery capacity. The more they import the less domestic oil they buy. The less they buy, the less oil the independents can produce, once the above-ground storage has been fully utilized. At this point, State programs prorate production to prevent waste and to permit to each producer his share of daily allowables.

It is unsound from the consumers economic standpoint to become dependent upon foreign oil. Even if foreign sources were not susceptible to the whims of dictators and unstable governments, it should be remembered that foreign oil production is controlled by a handful of international oil combines. In contrast, the domestic petroleum industry consists of thousands of individuals, partnerships, and companies engaged in the production of petroleum. In view of these facts, is it better for the consumers of this Nation to be at the mercy of a few international oil companies? Or is it better that they rely upon thousands of producers in this country? The answer is obvious. The President's order, by preserving competition, will better protect the consumer.

The capacity of American producers is over 10 million barrels per day. They have been permitted to produce only 7,100,000 barrels per day.

#### DANGER OF UNDESIRABLE CONTROL OF INDUSTRY

The objection has been raised that the order of March 10 leads straight down the road to greater bureaucratic control over U.S. industry.

This supposition is completely fallacious. Since the first days of our Constitution, the Federal Government has regulated foreign commerce. This exercise of constitutional authority need not, and, in fact, it cannot legally lead to controls of prices and wages of domestic industries.

As I have mentioned previously, the action of the President to limit oil imports is under specific provisions of law wherein the Congress has delegated responsibility to the President. The law, commonly referred to as the national security amendment, was first enacted as section 7 of the Trade Agreements Extension Act of 1957. It was further amended and clarified last year in section 8 of the Trade Agreements Extension Act of 1958. This law gives the President authority to limit imports in the interest of national security. The law gives the President absolutely no authority to control prices, wages or any aspect of a domestic industry. To attempt to do so would be outside the law. It is fantasy to speculate that this law authorizes broadside Government controls of industry operations. Any attempt to so extend it certainly would fail for lack of legal basis.

Some Members of this body seem to abhor the thought of the Federal Government exercising its constitutional right and responsibility to control foreign commerce. The fact is that until recently the few international oil companies which control most of the foreign oil production have been controlling oil imports to their own liking.

For almost 4 years, the executive branch has been endeavoring to persuade these importing companies to limit their imports. These pleas and efforts for voluntary restriction have been flagrantly disregarded by importing companies with the result that imports have jumped to unprecedented levels.

#### CHARGE OF DISCRIMINATION UNFOUNDED

It has been charged that the President's program is discriminatory against regions of the United States without indigenous fuel supplies. This charge is likewise without foundation.

The President's order will not result in a drastic cutback in imports. It, in fact, will permit petroleum imports at a very substantial rate. Prior to World War II, total petroleum imported into the United States amounted to about 5 percent of domestic production. Following World War II, during the period 1946 to 1950, imports increased rapidly, averaging about 10 percent of domestic production. During the period 1951 to 1955, imports increased further, averaging about 16 percent of domestic production. The new oil import order will permit imports to continue at a rate equivalent to a rate approximately 20 percent of domestic production. Certainly this cannot be criticized as a drastic cutback. It is, in fact, a most reasonable limitation.

It is true that the order constitutes a cutback from the rate of imports during the past 3 years. For example, during 1958 total imports amounted to 25 percent of domestic production. But it became obvious that such high rates of imports were crippling the domestic industry and causing a serious decline in the exploratory and development efforts of the domestic industry. No one has sought to eliminate all petroleum imports.

The President's Special Cabinet Committee To Investigate Crude Oil Imports carefully considered this aspect of the problem. In its 1957 report, it had this to say:

"Domestic consumers are utilizing an increasing amount of petroleum products for transportation, fuel, heating, and many other aspects of consumer life. In the event of a national emergency, it is essential to these consumers that there be adequate supplies at reasonable cost, both now and in the future. The low cost of imported oil is attractive, but excessive reliance upon it in the short run may put the Nation in a long-term vulnerable position. Imported supplies could be cut off in an emergency and might well be diminished by events beyond our control. This vulnerability could easily result in a much higher cost, or even in the unavailability, of oil to consumers. It is therefore believed that the best interests of domestic consumers, as well as of national security, will be served if a reasonable balance is maintained between domestic and foreign supplies."

During recent months the Government of Venezuela has taken action to increase the taxes imposed upon American companies operating there. This action further illustrates the instability of foreign oil from a consumer standpoint.

As consumers, the more we become dependent on any foreign source, the more we are at their mercy with respect to the price we are forced to pay. Once we become dependent upon foreign sources, we will have no choice but to pay whatever price is asked. The slight savings we might temporarily enjoy could prove very expensive a few years from now.

#### CANADA IS TREATED FAIRLY

The mandatory oil import program has been criticized on the grounds that it would complicate our relations with Canada. Let us weigh the impact of the program upon our northern neighbor before we jump to that totally unwarranted conclusion. It is important to realize several facts:

First, oil as such is a minute particle of our overall trade with Canada.

Second, the mandatory program makes generous allowances for Canadian oil imports.

Third, the importing companies in the Pacific Northwest have not been filling their allocations under the voluntary program with Canadian oil, not because of any U.S. Government restrictions, but because these importers found a cheaper source of supply, namely the Eastern Hemisphere.

As to oil in the overall Canadian trade picture, it should be noted that in 1958 petroleum accounted for only 2.4 percent of the total U.S. exports to Canada and only 3 percent of the total U.S. imports from Canada.

In 1958 the United States exported \$3,400 million worth of goods to Canada. Petroleum accounted for \$82 million of that total. We imported \$2,600 million in goods from Canada, of which \$78 million was in petroleum. The following table presents these figures:

CANADIAN-AMERICAN TRADE, 1958

	Total exports (millions)	Petroleum exports (millions)	Percent of total
Canada to United States.....	\$2,600	\$78	3.0
United States to Canada.....	3,400	82	2.4

This chart illustrates the obvious fact that Canada finds it economical to ship oil to us in the west and we find it economical to ship oil to Canada in the east.

The mandatory program makes allowances for refineries in the north central portion of the United States, which have easiest access to Canadian oil. It provides that imports of these refineries will not be within the program. Thus, they will be allowed to import without restrictions whatever they need in the way of imports from Canada.

During the past year when the voluntary program was in effect, importers in the U.S. Pacific Northwest, who historically have purchased Canadian crude oil, began to turn more and more to the cheaper crudes of the Eastern Hemisphere.

The voluntary program did not establish the source of imports, nor does the present mandatory program. If importers wish to purchase all their imports from Canada, there is nothing in the program to rule otherwise.

But let us face the facts. By and large, American importers do not want oil from Canada. In 1957, imports into the west coast from Canada totaled 95,000 barrels daily. In 1958, this total dropped to 25,000 barrels daily despite the fact that the Government's crude oil allocation was more than 75,000 barrels daily for companies in that area who normally imported from Canada.

In the last quarter of 1958, imports from Canada into the west coast totaled only 11,000 barrels daily, some 65,000 barrels below the daily allocation. This decline took place despite the fact that two of the importing companies in the area have pipelines from Canada to their refinery gates.

This record shows that the President's program does not discriminate against Canada. If there is, or has been, discrimination, it has been at the hands of the importing companies, not the U.S. Government.

In addition, let us examine Canada's own record. In 1954, Canada imported 95,000 barrels daily from the United States. In 1957, this declined to 80,000 barrels daily. In contrast, during this same period, imports into Canada from the Middle East and Venezuela increased from 218,000 barrels daily in 1954 to 320,000 barrels daily in 1957. As a result, about 45 percent of Canadian consumption is being supplied by Middle East and Venezuelan oil. Canada imports large quantities of low-cost Middle East and Venezuelan oil, rather than U.S. oil, to meet her large eastern markets, and, at the same time, takes the position that she has an established right to export her own production into the United States.

It might be well to take a look at our trade experience with Canada during the Korean conflict. In 1950, we imported 108,000 tons of lead pigs and bars from Canada. On January 26, 1951, our Government felt it necessary to impose price controls upon lead and other non-ferrous metals. This immediately caused Canadian producers to divert their lead to other markets where they could obtain a higher price. Our lead imports from Canada were cut almost in half. In 1951, they dropped to 57,000 tons. In spite of our great need for lead during the Korean conflict, the incentive to sell to other markets was too great for our Canadian neighbors to refuse.

This is not to condemn our good neighbors but merely to point out that a fair minded Canadian has no basis to criticize an order which protects American interests in a moderate way without discriminating against Canada.

#### VENEZUELA UNDERSTANDS

The fear has been expressed that this program would damage our relations with Venezuela. It would appear that Americans are more worried about this than the

Venezuelans. Their Minister of Mines and Hydrocarbons, Sr. Juan Pable Perez Alfonzo, has stated that he does not regard the new U.S. mandatory imports control plan as a substantial change in the situation. Sr. Alfonzo said:

"Obligatory restrictions in the United States do not modify substantially the existing situation of the oil industry in this nation.

"For some time now, voluntary restrictions have shown the way toward stability of markets and prices. It is this stability that we are interested in.

"Venezuela, like the United States, wants to avoid upsetting the oil industry either here or there through undue market competition."

It must be remembered that there has been a fantastic increase in the importation of oil from Venezuela in the last 10 years. No other nation than the United States, capable of producing all the oil it needs, would consider allowing as much oil to come into the country. No other nation would have been so self-effacing.

The Venezuelans are certainly intelligent enough to recognize their good fortune in obtaining a large share of the American market.

Our prime purpose in economic assistance to friends and allies should be to help other nations to provide their own requirements rather than to displace American workers.

Our good-neighbor policy of allowing excessively large imports has benefited more than anyone else, the large oil companies. A country such as Argentina, which has its own nationalized oil industry will find little opportunity to sell oil in the United States. The large integrated companies who own the tankers and the refineries are not interested in buying oil from other sources. They will not ship it and they will not be anxious to refine it. They can make more money producing their own oil overseas.

Mr. President, I have felt compelled to go into considerable detail to produce the facts and figures to put to rest a great number of uninformed charges and statements which have been cast about this Chamber and that of the House of Representatives in rather willy-nilly fashion. Their statements do credit to the extremities of their imagination. Practically none of these statements had any documentation whatever. I regret to say that a number of them exposed an abysmal lack of information concerning even the most elementary aspects of the petroleum industry. A great number of them would appear to rely upon the popular misconception that the domestic petroleum producer is a powerful, vested, special interest, gaining special advantages to which he is not entitled.

Herblock, the great cartoonist for the Washington Post, usually pictures the typical oil man as fat and prosperous and a cigar smoker. This picture, while extremely exaggerated, should be confined strictly to the importer. The typical domestic producer who is not in a position to operate overseas, could more accurately be pictured in khaki work clothes. Most of our small independent producers work hard for no more than the equivalent of a decent wage, and many go broke. A few lucky and skillful ones strike it rich, but that percentage is extremely small.

At a later date, I expect to present more information to clear up the false public impression about the financial status of the independent oil producers. It will be shown that earnings for the domestic industry as a whole are about the same as for manufacturing generally.

#### THE FOREIGN TAX CREDIT

It is the billion-dollar American oil companies which are reaping the benefits from foreign oil imports. These large corporations are benefited by a tax advantage which makes the percentage depletion allowance appear very small by comparison.

The operation of the foreign tax credit has caused the large oil companies to pay practically no tax whatever on their fantastic profits from foreign oil. As I have attempted to explain to a number of my friends, any reduction in percentage depletion for oil would not bring additional revenue to the U.S. Government from the enormous income from foreign oil, because it would only result in Venezuela, Saudi Arabia, Iraq, Kuwait, and Indonesia increasing their tax on American oil companies to claim for their treasuries that which would otherwise escape their taxation to the benefit of Uncle Sam.

Anyone who cared to enlighten himself on the manner in which this foreign tax credit has been used to deny revenue to our Government could satisfy himself in short order by reading the report drafted by the Joint Committee on Internal



Revenue Taxation and made available to the Senate Committee on Finance. The report explains how this type of tax avoidance was used by Arabian American Oil Co., in pursuance of policies of the Government of Saudi Arabia.

#### INFERENCES OF CORRUPTION

I notice that the junior Senator from Wisconsin [Mr. PROXMIRE] told the Senate yesterday:

"The oil industry has won a position of corrupting power and influence in our Federal Government."

Mr. President, that statement sounds extremely like some of those which I have heard made by a previous junior Senator from Wisconsin. I hope very much he will produce his evidence that the smaller and independent domestic producers have corrupted the Congress which passed a law compelling the President to take action or that they corrupted the President who acted, well knowing that it was his duty. If the junior Senator from Wisconsin knows of unexposed corruption in Government, it is certainly his duty to bring forth his evidence.

During my 10 years of service in the Senate, it has been my duty to vote upon a number of trade bills and a number of amendments affecting the petroleum industry when such amendments were offered to trade bills. In some years when oil imports were at a lower level, I have voted on the side of the major companies. In recent years, when oil imports began to threaten the domestic industry, I have felt it my duty to vote and fight to control foreign imports.

It has always been my feeling that both the large corporations and the small producers were entitled to be heard by the junior Senator from Louisiana. Both sides have very large investments in the State which sent me to the Senate. I am prepared to testify under oath that there hasn't ever been a single instance in 10 years during which the representatives of oil producers, either large or small, be they foreign producers or domestic companies, have made any offer to reward or threat of reprisal with regard to any position that I have taken or proposed to take concerning their interest. The junior Senator from Louisiana is certainly not one who owes his election to the influence of the oil companies. They were almost unanimous in their opposition to me—I mean both the independent and the major oil producers—when I was elected to the Senate in 1948, in large measure because I had strongly favored a very heavy increase in severance tax on oil at the State level. If I had known them to be less than honorable, I would not state to the contrary.

I believe I have shown that the President's order will help to preserve a domestic petroleum industry. In preserving the thousands of small independent producers, the President's order will assure vigorous competition by many thousands of competitors. Such competition is necessary if the consumer is to be protected from monopolistic pricing.

I believe I have demonstrated that the President's order has not and will not disturb our friendly relations with our neighbors or our friends throughout the world.

Quite the contrary, it will assure our ability to go to the aid of at least a dozen of our important friends and allies throughout the world in the event that everyone else fails them.

I believe I have demonstrated that the petroleum industry has accepted a rate of competitive imports compared to exports many times beyond the contribution of other American industries.

Above all, I believe I have demonstrated that the logic of the report of the President's Special Committee to study this matter is inescapable, and that the security of this Nation requires that we maintain a domestic petroleum industry adequate to serve this Nation in times of crisis.

Those who have experienced the cold winter months of World War II when fuel was strictly rationed and those who stand ever ready to make great sacrifices if need be in time of peace as well as in time of war, would never want this Nation to be at the mercy of uncertain and undependable sources of fuel during wartime or during national emergencies.

It is for this final reason that I am satisfied that all thoughtful Americans who take the trouble to acquaint themselves with the problem will hail the President's order as a desirable one, required by act of Congress and required by his duty to preserve this Nation.

## SECTION-BY-SECTION SUMMARY OF THE "ENERGY REVENUE AND DEVELOPMENT ACT OF 1973"

## TITLE I. SHORT TITLE—STATEMENT OF POLICY AND PURPOSES

*Section 101. Short Title:* Section 101 denominates the bill—the Energy Revenue and Development Act of 1973.

*Section 102. Statement of Policy and Purposes:* This section contains a statement of policy and purposes. The following summarizes the points in the statement:

1. It is the policy of the U.S. to become energy independent by 1985.
2. Achievement of this goal is essential for the nation's economic growth, full employment, balance of payments equilibrium, and national security.
3. Attaining the goal requires a national energy policy, and a central authority to implement such a policy with the advice and assistance of an independent commission of energy experts.
4. The U.S. has enormous fossil fuel reserves; it is imperative that these resources be rapidly developed.
5. The public and private sectors must cooperate to develop alternative energy sources and systems—including solar, geothermal, wind, nuclear fusion and fission, coal gasification and liquefaction, conversion of organic materials and others.
6. Attaining energy self-sufficiency will require a massive investment of capital and technology.
7. Public funding of energy programs requires the imposition of taxes on energy sources with proceeds to be deposited in an energy trust fund.
8. Private funding requires that the private market be permitted to operate freely to attract the capital necessary for research and development of energy. Accordingly, price controls on fossil fuels must be phased out, and immediately terminated on articles needed in energy production. Decontrol of prices on fossil fuels should be carried out subject to safeguards to avoid excessive profits.
9. Foreign energy sources have proved to be an unreliable source of supply. However, because of relatively cheaper extraction costs abroad it will be necessary to impose variable duties on petroleum and petroleum products from all countries and quota limitations on petroleum and petroleum products sought to be imported into the U.S. from countries which have embargoed shipments of petroleum to the United States in order to assure a domestic climate conducive to capital energy investment.
10. Achieving energy self-sufficiency also requires the granting of tax incentives to stimulate domestic fossil fuel production and the removal of tax incentives which encourage foreign fossil fuel production by U.S. companies.

## TITLE II. ENERGY TRUST FUND—TAX ON ENERGY SOURCES

*Section 201. Establishment of Trust Fund:* This section creates an energy trust fund in the U.S. Treasury to be financed by the proceeds of an energy tax on sources. The trust fund would be managed by the Secretary of the Treasury in consultation with the Administrator of the Federal Energy Administration. The trust fund would be administered and invested in interest-bearing obligations of the U.S. or obligations guaranteed by the U.S., as are existing trust funds. Expenditures from the trust fund would be accomplished as provided by legislative appropriation acts.

*Section 202. Tax on Energy Sources:* This section imposes an excise tax on all energy sources by their British thermal unit (Btu) value including the extraction of fossil fuel within the United States, the production of electricity, using any energy source other than fossil fuels, and upon the importation of fossil fuels and their derivatives. The tax on energy sources would be imposed at rates which would vary for each year between July 1, 1974 and July 1, 1984 in order to raise revenues consistent with projected energy expenditures requirements.

Thus, the bill imposes a tax on energy sources of 4.1 cents per one million Btu for 1974 which ascends in stages to a rate of 6.5 cents by the year 1978 and thereafter declines to a rate of 2.8 cents by 1984, after which time the tax would be terminated. The tax would raise approximately \$50 billion over a ten-year period, beginning in 1974 with \$3.2 billion, increasing to \$5.8 billion in 1978. A five cent per million Btu tax, which is slightly higher than the average tax in the bill, would mean an approximate increase of 29 cents for a barrel of crude oil, \$1.20 a short ton of coal and 5 cents for a thousand cubic feet of natural gas. The tax

would be imposed on classes or grades of energy, as certified by the Federal Energy Administration.

TITLE III. FEDERAL ENERGY ADMINISTRATION (FEA)

*Section 301. Establishment of FEA:* This section creates a Federal Energy Administration (FEA) to be directed by an Administrator and a Deputy Administrator to be nominated by the President and confirmed by the Senate.

*Section 302. National Energy Program:* This section charges the FEA with the responsibility for developing and carrying out a national energy program involving energy research, demonstration, development, utilization and conservation. The FEA would be charged:

1. Developing the information and technology necessary to support development of the widest range of energy policy alternatives necessary to attain energy self-sufficiency.
2. Assessing and directing Federal energy research and development to assure adequate reliable economic and environmentally acceptable energy systems.
3. Encouraging energy conservation and efficient energy production conversion and consumption.
4. Providing solutions to immediate energy shortages.
5. Formulating and carrying out energy research and development and demonstration programs, with full consideration of the efficiency and environmental affects of conventional energy sources as well as middle and long term alternative energy sources.

*Section 303. Authority of Administration:* This section authorizes the FEA to promulgate rules and regulations and to fully exercise the powers vested in it by law. These powers include:

1. Entering into contracts and agreements for energy research, development and demonstration;
2. To acquire laboratories, research and testing sites;
3. To enter into contracts, leases, cooperative agreements with, and to make grants to, educational institutions, research firms, corporations, etc., to construct demonstration type or full scale commercial size facilities to produce energy from oil shale, coal gasification, solar power, tidal power or other unconventional sources of energy;
4. To provide loan guarantees to persons engaged in the prospecting, exploration, development or production of oil or natural gas pursuant to contractual agreements; and other authorities.

*Section 304. Loan Guarantees:* This section specifies the criteria under which loan guarantees may be made in order to raise private capital to produce energy.

*Section 305. Patent Policy and Mandatory Licensing:* This section provides that the technology arising from all energy projects undertaken by or under the authority of the FEA be made available at the earliest possible date to the general public. The FEA would determine in public proceedings whether patent licenses should be granted on a royalty-free basis or on a basis designed to recover part or all of the cost of federal research. Other provisions of Section 305 contain the rules and guidelines to be followed by the FEA in assuring that the technological fruits of its energy programs are immediately and properly made available to the private sector.

*Section 306. Monetary Awards:* This section empowers the FEA to make monetary awards, within carefully proscribed limits, to persons deemed to have made significant contributions to energy research and development.

*Section 307. Technical Amendments:* This section provides statutory titles of Administrator and Deputy Administrator of FEA.

*Section 308. Authorizations:* This section authorize that funds may be appropriated out of the trust fund to carry out the purposes of this Act.

*Section 309. Annual Reports:* This section requires that the FEA report to the Congress annually on its activities.

*Section 310. Transfer of Functions:* This section transfers to the FEA all functions previously carried out by the Atomic Energy Commission which relates to the peaceful uses of atomic energy.

*Section 311. Future Transfer of Functions:* This section authorizes the President, for a period of 36 months following the date of enactment, to transfer energy functions from other agencies to the FEA.

## TITLE IV. COMMISSION ON ENERGY TECHNOLOGY ASSESSMENT (CETA)

*Section 401. Establishment of Commission:* This section creates an independent Commission on Energy Technology Assessment, consisting of 7 scientists, 7 engineers, and 7 economists. The Commission will be directed by a Commissioner who shall be appointed by the President with the advice and consent of the Senate. The Board members shall be appointed for a ten-year term in office staggered to assure continuity and independence.

The basic functions of the Commission will be to advise and make recommendations to the FEA regarding the qualities of research, development and demonstration undertaken under the FEA sponsorship and generally to critically evaluate national energy policy and its implementation.

*Economic Models:* The Commission would also construct and maintain economic models of the energy needs of the United States, and the alternative means and costs of satisfying those needs currently and during each subsequent five-year period. The information would be made available to the public.

*Adversary Studies:* The CETA would also perform "adversary studies", critically evaluating the merits of government-sponsored R & D efforts, and the performance of the private sector in developing energy supplies.

*Independent Funds:* CETA would be funded by a portion (one percent) of the trust fund monies received during the preceding fiscal year.

The Commission will have its own staff of experts and will make periodic reports to the Congress and to the public.

## TITLE V. TERMINATION OF PRICE CONTROLS

*Section 501. Petroleum Fossil Fuels and Infrastructure:* This section amends the Economic Stabilization Act to phase out price controls on prices (over a one-year period) of petroleum products, including oil, natural gas, and coal. In addition, Section 501 immediately would terminate price controls on steel pipe, drilling equipment, casing, or any other steel products certified in short supply and used in fossil fuel extraction, refining, and transportation.

*Section 502. Natural Gas:* This section amends the Natural Gas Act to deregulate the prices on new natural gas in interstate commerce and, as contracts expire it would deregulate natural gas for use in interstate commerce produced in existing wells.

## TITLE VI. TAX ENFORCEMENT PROVISIONS (EXCESS PROFITS TAX)

*Section 601. Excise Tax on Uninvested Profits from Energy Sources:* This section would impose an excise tax on excess profits from energy sources to the extent that such profits are not reinvested in qualified energy projects. The tax would be 40 percent of the profits from energy sources. The profit allowance from energy sources for any person is set at 20 percent of his average net investment for the fiscal year or \$100,000, whichever is greater. Profits in excess of that amount would have to be reinvested in qualified energy projects, or they would be subject to the tax.

## TITLE VII. IMPORTS OF PETROLEUM, PETROLEUM PRODUCTS, NATURAL GAS AND CERTAIN DRILLING AND MINING EQUIPMENT

*Section 701. Variable Import Duties:* This section would impose variable import duties on petroleum and petroleum products imported into the U.S. The duty would be equal to the amount by which the domestic price of the commodity exceeds the price of the article sought to be imported into the United States.

*Section 702. Imports From Certain Arab Countries:* This section would impose a quota limitation not to exceed 5 percent of domestic consumption on petroleum and petroleum products imported into the U.S. from the Arab countries which have embargoed exports to the U.S.

*Section 703. Relaxation of Import Controls on Certain Steel Drilling and Mining Equipment:* This section would request the President to enter into negotiations with countries which have voluntarily limited their exports of steel products to the United States for the purpose of importing increased quantities of steel articles certified in short supply and used in fossil fuel extraction.

*Section 704. Negotiations by Oil Importing Countries with Oil Exporting Countries:* This section would request the President to enter into negotiations with other oil consuming nations to form a "consumers union" organization which would bargain collectively with the foreign producing nations. The Federal Energy Administrator would be the chief representative for the United States in negotiating on

price and quantities of imports, and would represent the United States in all negotiations with major oil exporting nations prior and subsequent to the formation of a consuming nation organization. Consuming countries which refuse to enter into such an organization with the United States shall not be accorded most-favored-nation treatment by the United States.

TITLE VIII. EXPORT CONTROLS ON FOSSIL FUELS, DRILLING AND MINING  
EQUIPMENT

*Sections 801-807.*—These sections would impose export controls on petroleum, petroleum products, fossil fuels and certain drilling and mining equipment. The Secretary of Commerce would be directed to determine quarterly the quantities of such articles that would be available for export and would issue export licenses according to historical patterns of such exports. There is built-in flexibility in the administration of this provision.

TITLE IX. TAX INCENTIVES FOR INCREASED PRODUCTION OF ENERGY SOURCES

*Section 901. Tax Credit, Exploratory Drilling, Secondary and Tertiary Recovery Costs:* This section amends the Internal Revenue Code to create a double investment tax credit (14 percent) for domestic exploratory drilling expenses and secondary and tertiary recovery costs.

*Section 902. Tax Credit, Depreciable Property Used in Extraction, etc. of Energy Sources:* This section provides an additional tax credit (14 percent) for depreciable property placed in service for the exploration for, or the development, extraction, refining, storage or transportation of domestic fossil fuels, or any other energy source.

*Section 903. Technical and Clerical Amendments.*

TITLE X. MISCELLANEOUS TAX PROVISIONS

*Section 1001. Foreign Percentage Depletion and Intangible Drilling Expenses:* This section would repeal prospectively the percentage depletion allowance and intangible drilling and development costs provisions for oil and gas wells located outside the United States.

*Section 1002. Credit or Deduction for Residential Energy Conservation Expenditures:* This section would permit individual taxpayers to credit against their income taxes an amount equal to 50 percent of their expenditures for residential energy conservation, such as storm windows costs, but not to exceed \$1,000. In lieu of the tax credit the individual taxpayer could deduct up to \$1,000 for such expenditures from their taxable income.

TITLE XI. NAVAL PETROLEUM RESERVES; INCREASED PRODUCTION  
ON FEDERAL LANDS

*Section 1101. Transfer of Jurisdiction:* Under this section, all jurisdiction of the Secretary of the Navy over U.S. naval petroleum and oil shale reserves would be transferred to the Secretary of the Interior, ninety days following the date of enactment.

*Section 1102. Comprehensive Plans for Land Use or Disposition:* This section directs the Secretary of the Interior to report to the Congress, within 12 months, exploration, development and production of fossil fuels from the Naval petroleum and oil shale reserves by the private sector under U.S. mineral leasing laws.

*Section 1103. Claims of Alaskan Natives:* This section protects all rights and claims by Alaskan natives to lands comprising naval petroleum reserves in the State of Alaska.

*Section 1104. Increased Production of Oil and Gas on Federal Lands:* This section authorizes and directs the Secretary of the Interior to require that oil and gas fields in lands owned by the United States, including the outer Continental Shelf, be fully developed and produced at a "maximum efficiency rate," i.e. a rate that could be sustained without damage or loss to the oil and gas reservoir or the ultimate recovery of crude oil under sound conservation, economic and engineering principles.

Senator GRAVEL. We have a distinguished group of witnesses. That group is led off by none other than the person who has espoused the concept of an energy trust fund and a person for whom I have

great personal respect and friendship. It is, of course, the distinguished Senator from Kentucky, Senator Cook.

Senator Cook, we are happy to have you here. Please proceed at the speed you wish.

**STATEMENT OF HON. MARLOW W. COOK, A U.S. SENATOR FROM THE STATE OF KENTUCKY**

Senator Cook. May I thank the chairman very much.

It is difficult for good friends to talk about Senators and chairmanships and so on and so forth.

May I say, Mr. Chairman, we have a number of inserts which I will not take the time to stop to put in the record. They are in my remarks. We will do it afterward, so I will go right through this, as I understand you have got quite a docket this afternoon yourself.

Mr. Chairman, all of us here are deeply concerned over the shortage of energy fuels. We hear a great deal of rhetoric today concerning the magnitude of this shortage, and it also seems to be popular to participate in blame fixing. While I agree that it is important for the Congress to determine the circumstances which led us to this undesirable condition and take appropriate action, I submit that what we must do with all urgency is to develop solutions to our problems and provide the farmer, the businessman, and all citizens of the Nation with the fuels they need to heat their homes, cook their food, plant and harvest their crops, conduct their commerce, and preserve their way of life.

I believe that we have made a very substantial beginning, particularly regarding the allocation of the available fossil fuel. However, while the allocation of shortages is important we must act to provide additional fuels in usable form.

To take the next step and provide these fuels, we must first determine very accurately just where we are as regards requirements and assets—not where we wish we were, not where we could have been had we acted more prudently—but where we are. And, gentlemen, this in itself is no simple task.

As I believe that positive action to deal with our energy problems is the purpose for which you are conducting these hearings, Mr. Chairman, I congratulate you and Senator Dole and am very pleased to participate and offer my support.

In attempting to determine just where we are, let me refer to a document entitled "Report to Richard M. Nixon, President of the United States, Submitted by the Chairman of the Atomic Energy Commission." This report is dated December 1973, and the first finding states:

Present energy problems stem, in large part, from lack of a coordinated national energy research and development program over the last 20 years. Only nuclear power has received sustained support at adequate levels.

I would call attention to the two words "sustained" and "adequate" as they are contained in this finding, because to me they are the foundation upon which we must build our program. Any research and development program designed to provide the energy required by this Nation is doomed to failure unless it includes sustained adequate funding. I therefore am in complete agreement with this finding, and I

submit that we can ill afford to delay further the adoption of a viable program so funded.

The AEC study also recommends that the energy research and development administration, ERDA, be established immediately so that "it can be operational by July 1, 1974." I also agree with this finding.

I suggest that the necessary legislation to implement both of these AEC recommendations was introduced in the Congress on November 13, 1973, by this Senator for himself, Senator Baker, and Senator Bartlett. I refer to S. 2694. I request that a copy of this bill, along with the introductory remarks, be included in the committee record.<sup>1</sup>

It was my conviction then, and I repeat:

We in this country solved our highway problems with the Highway Trust fund—no one doubts that this would never have been accomplished without such a trust. R. & D. in the energy field will never solve the problems of this nation without the essentials of a uniform facility to attack the problem and a specific energy trust to allow such a massive program to unequivocally meet a deadline of absolute accomplishment.

I would also call attention to the fact that on July 13 of last year for myself, Senator Robert Byrd, and Senator Baker, I introduced an earlier version of the trust fund concept in S. 2167, and I request that this bill and the attendant remarks also be included in the record.<sup>2</sup>

My argument remains that:

In 1956 when the decision was made to undertake the construction of 40,000 miles of super interstate highways, we recognized that in so doing we were tackling the greatest construction project in the history of man. We recognized further that to achieve our goal that we must have assured funding over a continued period. We realized that we must remove the uncertainties inherent in dependence on annual appropriations.

The decision was made by the 84th Congress and President Eisenhower to establish a Highway Trust Fund for this purpose. Public Law 627 came into being. The fund derived its assets from taxes paid on fuels, tread rubber, tires, tubes, buses, trucks, and other highway use sources. In this way the user paid the cost of the highway. We now enjoy a highway network which I question would exist had we not created this fund.

As we seek the best solution to funding required R. & D. programs for energy, I think we would do well to consider our previous action. The requirement exists for assured and continuous funding of our R. & D. program. What better way to provide this funding than the creation of a Federal energy research and development trust fund? This fund could act as a repository for funds of a prescribed amount and expenditure could be made from the fund to meet requirements as they occurred over a continuous time period.

I suggest a sum of \$2 billion would be paid into the fund annually. I would not restrict or require that a specific amount be expended over a fiscal year and would permit the administration to expend the available funds over a continued period to meet requirements. Experience has shown that R. & D. projects usually begin with small initial funding requirements, and their requirements over succeeding periods are dictated by their success or failure.

In considering the source of revenue for this fund, I suggest that we again adopt the user approach. However, rather than revenue from the tax placed on the user I suggest that we utilize the revenue from the assets of the user. In this instance, the user is most certainly the public, you and I. And the asset of which I speak is our public land and more specifically that public land which lies on the outer continental shelf, OCS. For many years we had these assets but we did not consider them to be of any great value because the supply far exceeded the demand.

Let me digress just a moment, Mr. Chairman, about the President's remarks at 1 o'clock today. He asked that we increase the leases of our

<sup>1</sup> See p. 1039.

<sup>2</sup> See p. 1051.

public lands and offshore resources from the present 3 million acres that have been allocated from 1956 to 1973 to a figure of 10 million acres, which is really an increase threefold.

Therefore, I feel that it fits well within the confines of being able to finance this trust, purely and simply because under the basic concept this last year we have produced a lease sale of almost \$5 billion, and with a threefold increase, \$2 billion would not decrease the utilization of or the necessity of depending on current revenues from that source.

Senator GRAVEL. Would you permit me to interrupt you, because, unfortunately, I have to leave in about 20 minutes to attend a ceremony for signing the permit for construction of the Alaskan pipeline. This pipeline will mean a great deal both for Alaska and for the country in increasing domestic energy supplies.

Before that, let me just say from what I understand to be your testimony thus far, I think you are very much on track in contributing to our efforts to create an effective, long-range energy policy. However, I wonder if I might ask, with respect to the funding possibility, what your feelings are with respect to the workability of a BTU tax?

Senator Cook. May I say, Mr. Chairman, I have read your bill and I have read your schedule. I do not want to get into a long discussion, because you have to leave. But I would like to sit down with some committee staff at a later date to determine how you developed your percentages of tax; particularly the variance between July 1974 and July 1984 and your estimates for these figures.

Senator GRAVEL. May I briefly say that we conceived of the problem as similar to the space situation. The need for capital would go on a bell-shaped curve. That is, it would take some time for us to be able to raise and effectively use the large amount of funding required to meet our objectives. Then activity would increase with a crescendo effect, reach a peak and gradually come back down again.

The major purpose for the BTU tax is, one, to establish something that is equitable for all. I agree with you that there will be substantial revenue from OCS. The difficulty I have with financing the trust fund by lease bonuses is that I believe bonus bidding on leases should be discontinued. I will shortly introduce legislation to change this system.

When we require a bonus bid sale, as in Alaska, and in the State sector and the Federal sector, we get a large chunk of money placed up front by the oil companies. To me, this seems just a little ridiculous. Here, on one hand, we make the oil companies put up such a fee, right at the beginning, before they can drill one well. This is money that comes from their coffers. That causes them to go into unusual speculation.

Then we take that money, put it into a trust fund, and then turn around and provide them moneys to develop a prototype of activities, be it gasification, liquefaction, or other pure R. & D. It seems to me we are cycling the same kind of money.

I would hope that we would realize this and go to the British approach; that is, have no big bonus fees that the oil companies have to pay to get hold of the land to drill it. Instead we would have an agreement with the oil companies that they provide funds for exploration and if and when oil is found there, the American people share more generously than would have been the case in the more speculative approach. In this way we do not recycle the money. We get the oil companies moving very smartly.



Senator Cook. I have no disagreement with the theory, Mr. Chairman, but suggest that the theory has to be put in the form of legislation. We should not have it both ways. We should not attempt to eliminate the competitive basis by which leases are now made on the theory that they are still going to have to pay for those leases while at the same time impose a tax on them. Such action obviously doubles the cost of whatever resource is made available to the American people.

If we could allocate these leases by some system other than by our present system of competitive bidding, it should be considered. I am concerned that if we eliminate our present system that we could get ourselves in trouble. For example one company could have more of an opportunity than another and we might find an imbalance.

Let me repeat that I would not want to have the high lease charges and also have the BTU tax.

I may say there are some problems in the BTU tax aspect. I am not sure that I glean from your bill that you have an equal tax on what is utilized. For instance, would you impose that same tax on a TVA or an individual who produces a great deal of power? Do you get into the public-owned segment?

Senator GRAVEL. As we view it, the tax would be placed on the source of energy, whether the source be oil, be gas, a BTU rating of a hydrogenerator or an atomic generator, or a BTU rating of a ton of coal. The tax would be paid proportionately on that unit basis. In this way, you do not reward the inefficiencies that exist within our energy system; you reward the efficiency of the energy by the tax being at the source with everybody using whatever kind of energy is most advantageous. We could tax it at the source so when a ton of coal comes out of the ground it is rated.

Senator COOK. May I say to the chairman we are also very much in the ballpark with our \$2 billion figure because in the President's remarks today he talked about an expenditure of \$1.8 billion a year.

Senator GRAVEL. You have offered a vehicle to finance what other Senators are talking about. Until somebody puts up the money, it is only talk. That is the reason you deserve credit.

Senator COOK. We have problems that we can certainly work out.

I recognize that your approach at least does not consider the sale of public lands or the lease of public lands and the lease of offshore reserves as the only source of revenue. I think there are problems we can work out and that can be resolved.

Senator GRAVEL. If you will excuse me, I will leave it in the able hands of the ranking member of the committee.

Senator DOLE [presiding]. The Republicans are finally in control, Marlow. Go ahead.

Senator GRAVEL. That is for a very brief period.

Senator COOK. "Today we find that these OCS assets have indeed increased in value. The irony in this increase is that it has come about by an energy shortage, particularly oil and gas, which threatens to destroy many of our much more tangible and recognizable assets."

Subsequent to the introduction of these bills and on December 5, I appeared as a witness before the Government Operations Committee during the hearings being held on S. 2744 to establish the Energy Research and Development Administration. I request that a copy of this statement also be included in the committee record.<sup>3</sup>

<sup>3</sup> See p. 1054.

Senator Cook. At this time I again suggest that a trust fund be used in combination with ERDA.

For these reasons, Mr. Chairman, I am particularly pleased that the legislation we are discussing this morning, S. 2806, which was introduced by Senator Gravel, also provides for a trust fund.

I understand that there may have been some reluctance on the part of the executive branch to establish an energy trust fund. My early fears have been somewhat dispelled by the announcement by the Secretary of the Treasury on December 19, 1973, that one of the primary uses for the tax revenue produced by the proposed windfall profits tax would be to support an energy development trust. I think that the executive branch's recognition of the requirement for a fund is most significant.

During the 92d Congress I was pleased to support legislation which would have acted to deregulate the controls over natural gas as exercised by the Federal Power Commission. During the 93d Congress I continue to voice this opinion. In October of last year, in a statement before the Senate Commerce Committee, a copy of which I would like to include in the record, I stated that we must take decisive action concerning Federal controls and as a minimum permit new natural gas to seek its own price in the energy marketplace.<sup>4</sup>

I am pleased to see that S. 2806 proposes to accomplish this deregulation.

I would digress again a moment, Mr. Chairman, to say that we do have some problems that the committee should seriously think about in this regard. First of all, as you well know, we have long-term contracts for the utilization of gas. If we move into the field of deregulation, we find ourselves in a position where termination of contracts may well find the producer looking for a new buyer for that gas. I think we have to permit the original contractor something in the nature of a first refusal, I might say such action is very much contrary to my legal background because in essence what we would be saying, is that one has the right of first refusal or one has the right of first option to acquire that same gas that he has been acquiring.

We must recognize however that we would have a problem if we ran into a termination of a contract and a deregulation. It's conceivable that a company which is now supplying X with a trillion feet of gas a day could divert that gas to another part of the country purely on a price basis. As you well know, we now have adequate machinery before the Federal Power Commission whereby one gives the notice of renewal of that contract. I think it would be wise to look into just what exactly will occur if we do deregulate in regard to the present status of the hearings before the Federal Power Commission on the utilization of that gas which is under an expiring contract.

There is another question that you would have to look into and look into rather seriously. I refer to the treatment given to producers affiliated with the purchaser or purchasers and the production half. I suggest that they should be given the same treatment as independent producers.

I also believe that the establishment of the Federal Energy Administration is essential. We have too long been without a national

<sup>4</sup> See p. 1058.

energy policy. I understand that I will be followed tomorrow by Mr. Bill Simon, who now occupies the Federal Energy Office created by the President. I would add that I believe that he has made an excellent beginning, and that he has impressed us all with his vigor and determination to get on with the job. However, he can implement only that which the Congress enacts. The Congress, then, must face up to its responsibility with the urgency our Nation demands.

Mr. Chairman, I have not attempted to comment on all 11 titles of S. 2806, but rather to limit my remarks to a few specific comments on this proposed legislation. I think that S. 2806 contains many desirable features and I shall follow with much interest the record you develop here during the hearings.

In a way we can compare the hearings on energy R. & D. with R. & D. itself. In many areas we have proven R. & D. programs and are now ready for the next step, which is demonstration. I would certainly like to see the Congress now place its efforts in the next step and demonstrate its sincerity by enacting meaningful legislation.

Senator DOLE. Thank you, Senator Cook, and I apologize for being a little late. I am aware of the fact that you were a pioneer of the trust fund concept. In fact, I think in the testimony this morning Mr. Simon acknowledged again the administration's interest in the trust fund, and it appears to me there is support growing for it in the full Finance Committee.

Of course, I am aware of Senator Gravel's efforts to refine it and examine it to see what we can come up with. Apparently the administration and a considerable segment of the members of the Senate at least, are thinking the same, and it may well happen.

Senator Cook. May I say, Mr. Chairman, that I am disturbed in 2806 with the language on page 7. I say this to the majority staff, starting on line 20, energy programs. "Amounts from the Treasury shall be made available as provided by appropriation acts." That does bother me, purely and simply because I think one can create a trust and one can move away from that trust.

If in fact we are not going to allocate on a report from the Agency to the Congress relative to what its needs for research, development and demonstration really are, and then accept or reject that program without them saying that we shall have an appropriation act, then I am not sure what we are really doing. I think in effect we are saying what we have got to do is come back every year and have an appropriation act out of the trust.

We find in many instances in the past when this has been done—let's take coal liquifaction. Suppose it is slow. Let's take onsite gasification, whereby we cap off a coal seam and produce the gas directly from the ground. Suppose these things run into difficulty. I am concerned that the Congress may get impatient with the research and development and then not appropriate the funds required. Then we find these trusts broken. Everyone who needs funds and everyone who needs resources for other programs looks at this trust and says let's break it.

Senator DOLE. I understand. That is the same language in the highway trust fund.

Senator Cook. You know what has happened there. May I say, as a matter of fact we constructed highways that for a long time ended up in the middle of a field. It seems to me that after all we do

learn by experience. It seems to me that having watched a great deal of the trusts being held up for a long period of time, we are here fighting absolutely what I consider to be a deadline. That deadline is to see that within a very, very small percentage, that this Nation becomes self-sufficient in the energy field.

It bothers me that we see this trust and we have to have an act of Congress to appropriate from it every year, rather than the creation of the trust, then submit a program of research and development into the Congress to accept.

Senator DOLE. Thank you, Senator.

[Attachments referred to by Senator Cook follow. Hearing continues on page 1060.]

[From the Congressional Record, Tuesday, Nov. 13, 1973]

### SENATE

By Mr. Cook (for himself, Mr. Baker and Mr. Bartlett):

S. 2694. A bill to establish an Energy Research, Development, and Demonstration Administration, and to reorganize, consolidate, and supplement within it, Federal responsibility, authority, funding, and financing for conducting a national program for scientific research, development, and demonstration in energy and energy-related technologies designed to resolve critical energy shortages. Referred to the Committee on Interior and Insular Affairs.

Mr. Cook. Mr. President, I am cosponsor of S. 1283, introduced by Senator Jackson, an energy conservation measure. On review, however, I find that this bill makes no permanent requirements for funding, thus leaving it to Congress to appropriate at any level of funding after the first year, or at no level of funding at all.

Second, it fragments the research as follows:

Coal gasification, \$6 million per year for 10 years.

Coal liquification, \$7,500,000 per year for 12 years.

Geothermal, \$8 million for 15 years.

Advanced power cycle development, \$6,500,000 per year for 10 years.

Shale oil development, \$5 million per year for 8 years.

Each category has its own corporation and functions independently of the others. On reflection then, the Jackson bill has two serious shortcomings:

First. No trust is established, and funding is thus left to succeeding Congresses.

Second. Separate corporate structures to accomplish the same end is cumbersome, and will not work.

We in this country solved our highway problems with the highway trust—no one doubts that this would never have been accomplished without such a trust.

R. & D. in the energy field will never solve the problems of this Nation without the essentials of a uniform facility to attack the problem and a specific energy trust to allow such a massive program to unequivocally meet a deadline of absolute accomplishment.

Therefore, Mr. President, on July 13 of this year for myself, Senator Robert Byrd and Senator Howard Baker, I introduced S. 2167, a bill to accelerate energy research and development by providing adequate funding over a continuing period of time through the creation of an energy research and development fund. The fund would draw its support from those moneys received by the Federal Government from its lease sales of public lands on the Outer Continental Shelf. I reasoned that as it was the shortage of energy which now enhanced the value of these public assets, this new revenue should in turn be used to find relief to the energy problem itself. I still believe that this reasoning is sound and am more than ever convinced that we will never achieve our R. & D. goals by year to year financing and must adopt some type of trust fund concept. However, there is good argument for broadening the base of this fund by including receipts from Federal lease sales and all other sales or grants of development rights of energy sources on Federal lands.

It has now been 4 months since I introduced this bill and while I have been promised by the chairman of the Senate Interior Committee that hearings will be held at an early date, this date has as yet not been set.

In my original concept I envisioned that the fund would be managed and coordinated by the Interior Department. However, in my introductory remarks,

I recognized that new organizational concepts were being considered and suggested that should the President's reorganization reach fruition, that there may be a new office better suited for this purpose.

In his address to the Nation last Wednesday, the President put forward several programs to deal with the immediate energy problems we face today. I support his intent and applaud the rapid action being taken by the Interior Committee to develop the necessary legislation to implement these programs. However, as necessary as these programs are, they are all in the form of a fire fighting stop gap nature and do not address the long-term problem which this Nation must solve.

One program advanced by the President is of particular interest to me and this is the creation of an Energy Resource and Development Administration to control the Nation's efforts in this area. The idea is not new as it is found in the President's earlier program to create a Department of Natural Resources. What is new is the suggestion that we remove R. & D. from the proposed department and create a new independent administration. I think this is sound and I support it.

The President has compared the need for such an effort to the Manhattan project of World War II, which made this Nation the major nuclear power at that time. He also compared this need to the space program of the 1950's which made America the first nation to put a man on the Moon.

I might say there is one that he forgot, Mr. President, and that is that when World War II started, we all thought there was not going to be an automobile in the country that could get any more rubber tires.

It took this Nation 1 year to come up with synthetic rubber, and the only thing we care about rubber trees for today is that they give somebody shade somewhere in the world.

As the President expressed it:

"Whenever the American people are faced with a clear goal and they are challenged to meet it, we can do extraordinary things."

This then is the backdrop for the initiation of "project independence." However, much as I agree with the stated objectives of energy sufficiency by 1980, I am not convinced that the proposal as now being considered can attain this goal. I still hold that we need the energy trust fund. I believe that we need an independent agency to manage this fund and insure that we direct our efforts to programs ranging from the exotic—such as wind and tidal or ocean current power, to the realizable—such as coal gasification and liquefaction whether our goal is energy self-sufficiency by 1980 or 1985, this Nation's efforts must be wide-ranging and broad in scope. We must not overlook any possibility, however remote or far fetched it may seem.

Accordingly I am today introducing a bill which will accomplish these long-range goals and at the same time incorporate the vital trust fund concept contained in S. 2167. I go one step further, because I do not think that we can reach our goals by research and development alone. I believe that we must include the all important demonstration step in the process.

From my own personal experience I have found that when the R. & D. phase of energy production has been reached there is not adequate provision to support the demonstration phase so necessary to prove or disprove the R. & D. scale model. I suggest that with the creation of the Energy Research Development and Demonstration Administration—ERDDA—supported by adequate trust fund we have a fighting chance of locking our energy problems.

I ask unanimous consent that the bill along with the brief explanation attached be printed at the conclusion of my remarks. I solicit the support of my colleagues and urge that the Senate take prompt action to effect this legislation.

There being no objection, the bill and explanation were ordered to be printed in the Record, as follows:

S. 2694

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Energy Research, Development, and Demonstration Administration Act."*

## TITLE I

### STATEMENT OF FINDINGS AND DECLARATION OF PURPOSE

SEC. 101. The Congress hereby finds—

- (a) The nation is currently suffering a critical shortage of environmentally acceptable forms of energy.

(b) A major reason for this energy shortage is our lack of an aggressive research, development, and demonstration (referred to hereinafter as "research and development," in accordance with Section 117) effort to develop a national capability for energy self-sufficiency by proper utilization of our large reserves of domestic fossil fuels, nuclear fuels, and geothermal energy, and the potentially unlimited reserves of solar power, nuclear, and other unconventional sources of energy.

(c) Many current uses of our limited basic energy resources, including the conversion of basic energy to an alternate form are highly inefficient.

(d) Current levels of funding by the Federal Government for energy research and development are inadequate and too fragmented to develop a program of the scope needed to insure efficient use of existing sources and to identify and develop the most technically, environmentally and economically feasible methods for utilizing energy from domestic resources.

(e) The capital requirements of a total energy research and development program of the magnitude needed are beyond the means of private sources.

(f) The nation's critical energy problems can be timely solved only if a national commitment is made now to accord the highest priority, to dedicate the necessary financial resources, and to enlist our unequalled scientific and technological capabilities to meet the national energy needs, conserve vital resources, and protect the environment.

SEC. 102. (a) The general welfare, the common defense, and security urgently require and it is Congress' purpose here to undertake a national commitment to resolve the energy shortages and provide the means for achieving a national capability for energy self-sufficiency through socially and environmentally acceptable methods for producing, conserving, and utilizing all forms of energy.

(b) To effectuate that commitment it is Congress purpose to consolidate and strengthen existing and initiate new Federal programs for energy research and development, in an Energy Research, Development, and Demonstration Administration, established hereinafter and authorized and charged with exercising central responsibility for policy planning, coordination, support, and management of research and development programs, including commercial-sized demonstration plants, and respecting all forms of energy sources.

(c) The Congress further declares and finds that it is in the public interest that responsibility for all Federal energy research and development programs be transferred to the Energy Research, Development, and Demonstration Administration, and that this transfer be effected in an orderly manner assuring adequacy of technical and other resources necessary for the performance of such programs.

## TITLE II

### ESTABLISHMENT AND ORGANIZATION OF ENERGY RESEARCH, DEVELOPMENT, AND DEMONSTRATION ADMINISTRATION

SEC. 103. There is hereby established, as an independent establishment of the executive branch of the Government of the United States, the Energy Research, Development, and Demonstration Administration (hereinafter referred to as the "Administration" or "ERDDA").

#### BOARD OF GOVERNORS

SEC. 104. (a) The management and direction of all the affairs and interests of ERDDA shall be vested in a Board of Governors (hereinafter referred to as "the Board" or "the Governors"), composed of 15 members.

Eight of the Governors shall be Government officials, as follows:

1. As Chairman of the Board, the official designated by the President as having primary responsibility for energy policy (subject to Senate confirmation if not already confirmed for his primary office);
2. The Director of the National Science Foundation;
3. An Assistant Administrator of the National Aeronautics and Space Administration, designated by the Administrator of that Administration;
4. An Assistant Secretary of Defense, designated by the Secretary of Defense;
5. A member of the Atomic Energy Commission (proposed herein below to be renamed the "Nuclear Energy Commission"), designated by that Commission;
6. A member of the Federal Power Commission, designated by that Commission;

7. A member of the Council on Environmental Quality, designated by that Council;

8. The Administrator of ERDDA, appointed to that position in accordance with Section 107(b) below.

Seven Governors shall be appointed by the President with the advice and consent of the Senate, as follows:

1. A person with high qualifications and responsibilities in the coal industry whose appointment shall be made from a list of recommendations by the principal national organizations representing the coal industry;

2. A person with high qualifications and responsibilities in the nuclear power industry whose appointment shall be made from a list of recommendations by the principal national organizations representing the nuclear power industry;

3. A person with high qualifications and responsibilities in the natural gas industry whose appointment shall be made from a list of recommendations by the principal national organizations representing the natural gas industry;

4. A person with high qualifications and responsibilities in the petroleum industry whose appointment shall be made from a list of recommendations by the principal national organizations representing the petroleum industry;

5. A person with high qualifications and responsibilities in the electric industry whose appointment shall be made from a list of recommendations by the principal national organizations representing the electric industry;

6. A representative from the public at large with high qualifications and responsibilities for environmental concerns; and

7. A representative from the public at large with high qualifications and responsibilities for consumer concerns.

(b) The terms of the government members of the Board shall coincide with their terms in the offices here qualifying them to serve on the Board. The terms of the seven nongovernment members shall each be for 4 years subject to prior removal by the President, for cause, except that in order to provide staggered terms, the terms of 2 initial Governors, designated by the President, shall be for 3 years, the terms of 2 shall be for 2 years, and the term of 1 shall be for 1 year. Any Governor appointed to fill a vacancy occurring before the expiration of the term for which his predecessor had been appointed shall serve for the remainder of such term. Each Governor shall be reimbursed for travel and reasonable expenses incurred in attending meetings of the Board.

(c) 1. The Board shall meet quarterly and on call.

2. Vacancies in the Board, as long as there are sufficient members to form a quorum, shall not impair the powers of the Board.

3. The Board shall act upon majority vote of those members who are present, and any eight members present shall constitute a quorum for the transaction of business by the Board; except that a favorable vote of an absolute majority of the Governors in office shall be required for the approval of annual budgets, and for the appointment, removal, and setting of compensation for the Administrator and Deputy Administrator.

#### ADMINISTRATOR; DEPUTY ADMINISTRATOR

SEC. 105. The Administrator of ERDDA, appointed pursuant to Subsection 107(a) below, shall serve as the Chief Executive Officer of the Administration, in accordance with Subsection 107(c) below. The Deputy Administrator, appointed under Subsection 107(a) below, shall be the alternate Chief Executive Officer. He shall act for and exercise the powers of the Administrator during his absence or disability.

#### GENERAL COUNSEL; ASSISTANT ADMINISTRATORS

Sec. 106. There shall be within the Administration a General Counsel, and such number of Assistant Administrators as the Board shall consider appropriate. The General Counsel and the Assistant Administrator shall be appointed by, and serve at the pleasure of the Administrator.

### TITLE III

#### FUNCTIONS

SEC. 107. (a) The Board shall appoint the Administrator of ERDDA from a list of people recommended by the National Science Foundation, the National Academy of Science, and the National Academy of Engineering as highly compe-

tent to administer the important and complex energy research and development responsibilities of ERDDA. The Board shall also appoint the Deputy Administrator, and it shall have the power to remove the Administrator and the Deputy Administrator, and it shall fix their pay and terms of service.

(b) The Board may delegate its authority to the Administrator under such terms, conditions, and limitations, including the power of redelegation, as it deems desirable, and it may establish such Committees as it determines appropriate to carry out its functions and duties; such delegations shall be consistent with other provisions of this Act, shall not relieve the Board of full responsibility for carrying out its duties and functions, and shall be revocable by the Board in its exclusive judgment.

(c) The Administrator, as Chief Executive Officer of the Administration, shall be responsible to the Board for implementation of this Act and administration of ERDDA. He shall present an annual budget to the Board of Governors for their review and approval. After the Board has approved a budget, the Administrator may obtain specific moneys within it, from the fund established in Section 114 hereinbelow, by notice to the Secretary of the Treasury that such moneys are needed as of a certain date to carry out the program and budget approved by the Board.

(d) The Administration shall exercise central responsibility for policy planning, budgeting, initiation, coordination, support, and management of research and development programs respecting all forms of energy sources, including but not limited to those specified in Subsection (e) below. It shall be responsible for assessing the requirements for research and development in regard to various forms of energy sources in relation to near-term and long-range needs, for policy planning, and for budgetary and expenditure control to meet those requirements, for retaining, supporting, and where needed, strengthening effective existing programs, and for initiating new programs as needed for the optimal development of all forms of energy sources, from research through commercialized demonstrations, for providing appropriate priority and balance among nuclear, fossil fuel, geothermal, solar, and other energy research and development responsibilities, for managing such programs, for terminating them when their purpose has been accomplished or when they are no longer feasible, and for disseminating information resulting therefrom.

(e) The Administration shall have all the authority incidental, necessary, or appropriate to implementing its responsibilities, including without limitations, authorization:

1. To ensure that full consideration and adequate support is given to advancing energy research and development of efficient and environmentally acceptable energy sources, technologies, and techniques including but not limited to:

- (i) coal gasification;
- (ii) coal liquefaction;
- (iii) solvent refined coal;
- (iv) improved extraction methods and *in situ* conversion of fuels;
- (v) advanced power cycle development;
- (vi) shale oil development;
- (vii) geothermal energy;
- (viii) thermally-actuated heat pumps;
- (ix) fuel cells and other direct conversion methods;
- (x) solar energy;
- (xi) hydrogen as an energy form;
- (xii) nuclear breeder processes;
- (xiii) fusion processes;
- (xiv) magnetohydrodynamics;
- (xv) use of agricultural products for energy;
- (xvi) utilization of waste products for fuels;
- (xvii) cryogenic transmission of electric power;
- (xviii) electrical energy storage methods;
- (xix) alternative to internal combustion engines;
- (xx) wind power;
- (xxi) tidal power; and
- (xxii) ocean current and thermal gradient power.

2. To prescribe such policies, standards, criteria, procedures, rules, and regulations as it deems necessary or appropriate.

3. To enter into such contracts and agreements, including grant agreements, with public agencies and private organizations and persons; to make payments therefor (in lump sum or installments, and in advance or by way of reimbursement, and with necessary adjustments on account of overpayments and underpayments).



4. to engage in joint projects of a research, developmental, and demonstration nature with public agencies and private organizations or individuals in the organizational form deemed appropriate, and to perform services with or for them on matters of mutual interest, the cost of such projects or services to be apportioned equitably by the Administration.

5. to acquire any of the following described rights if the property acquired thereby is for use by or for, or is useful to, the performance of functions vested in the Administration:

(i) copyrights, patents, and applications for patents, designs, processes, and manufacturing data;

(ii) licenses under copyrights, patents, and applications for patents;

(iii) releases, before suit is brought, for past infringement of patents or copyrights; and

(iv) use of Federal lands (except lands preempted for other use by Federal statutes) which contain energy sources which ERDDA determines are necessary to carry out its research and development functions and programs. The responsible officials of such other departments or agencies which have jurisdiction over Federal lands are hereby authorized and directed to make such lands available to ERDDA under terms and conditions promulgated by them to protect the environment and other resource values of lands involved.

6. to make special studies concerning matters within the special competence of the Administration; to prepare from the records of the Administration special compilations, lists, bulletins, or reports; to furnish transcripts or copies of such studies, compilations, and other records; to provide copies of charts, maps, or photographs, and to provide services incident to the conduct of the regular work of the Administration. The Administration shall require payment of the actual or estimated cost of such special work in accordance with regulations prescribed by the President.

7. to exercise, in relation to the functions transferred herein, to the extent necessary or appropriate to perform such functions, any authority or part thereof available by law, including appropriations Acts, to the official or agency from which such functions were transferred.

(f) The Administration shall utilize or acquire the facilities of existing Federal scientific laboratories engaged in energy research and development; it shall also establish and operate additional facilities and test sites; and it shall utilize such services of contract agencies as it considers necessary to effectuate the purposes of this Act.

(g) The Administrator shall, as soon as practicable after the end of each fiscal year, submit a Report to the Board, and the Board shall submit a Report to the President for transmittal to the Congress, on the activities of the Administration during the preceding fiscal year, with a full accounting of receipts and expenditures, projects terminated and initiated, and plans and progress made in developing new energy supply and in attaining the capability of energy self-sufficiency from domestic resources.

(h) The President, in the ninth year after the effective date of this Act, shall report to the Congress his evaluation of progress under it and his recommendation for continuance of the Federal energy research and development programs.

#### TITLE IV

##### TRANSFERS

SEC. 108. There are hereby transferred to and vested in the Administration such Federal energy research and development functions and programs as are essential to ERDDA's fulfilling its obligations under this Act. Without limitation, such transfer shall include:

(a) All energy research and development functions and programs of the Atomic Energy Commission and of the Chairman and members of the Commission except those pertaining to nuclear weapons or military use of nuclear power. The Atomic Energy Commission's research and development functions related to such military purposes shall be transferred to the Department of Defense, and the Secretary of Defense and ERDDA shall establish a special liaison committee to provide coordination, cooperation, and economy between the Department of Defense and ERDDA as to their prospective research and development programs.

The remaining functions of the Atomic Energy Commission shall continue as provided in Section 115 below.

(b) All energy research and development functions and programs of the Secretary of the Interior, the Department of the Interior, and officers and components of that Department.

(c) The energy research and development functions and programs of such other Federal departments or agencies, including without limitation those in the Departments of Commerce, Transportation, Housing and Urban Development, and those in independent agencies such as the General Services Administration, the National Aeronautics and Space Administration, the National Science Foundation, and the Tennessee Valley Authority, as in ERDDA's judgment are necessary or appropriate for it to fulfill its responsibilities under this Act.

(d) Authority for reviewing and coordinating all other energy research and development functions and programs in Federal departments or agencies in the Executive Branch.

(e) Unexpended balances of appropriations, authorizations, allocations, and other funds relating to the functions transferred hereby to ERDDA shall be transferred as determined by the Director of the Office of Management and Budget in accordance with Section 109 below and with Section 202 of the Budget and Procedures Act (31 USC 581 (c)).

SEC. 109. (a) During the transition of transfers every effort shall be made to not in any way impede or impair the progress of current Federal energy research and development programs.

(b) Transfer of nontemporary personnel shall not cause any such employees to be separated or reduced in grade or compensation for one year after such transfer.

## TITLE V

### SAVINGS PROVISIONS

SEC. 110. All orders, determinations, rules, regulations, permits, contracts, certificates, licenses, and privileges which have been issued, made, granted, or allowed to become effective by the President, any Federal department or agency or official thereof, or by a court of competent jurisdiction, in the performance of functions which are transferred by this Act, and which are in effect at the time this Act takes effect, shall continue in effect according to their terms until modified, terminated, superseded, set aside, or revoked by the President, the Administrator, or other authorized officials, a court of competent jurisdiction, or by operation of law.

SEC. 111. (a) The provisions of this Act shall not affect any proceedings pending at the time it takes effect before any department or agency, or component thereof, functions of which are transferred by the Act, but to the extent such proceedings relate to functions so transferred, they shall be continued. Orders shall be issued in such proceedings, appeals taken therefrom, and payments made pursuant to such orders, as if the Act had not been enacted; and orders issued in any such proceedings shall continue in effect until modified, terminated, superseded, or revoked by a duly authorized official, by a court of competent jurisdiction, or by operation of law. Nothing herein shall be deemed to prohibit the discontinuance or modification of any such proceeding under the same terms and conditions and to the same extent that such proceeding could have been discontinued if the Act had not been enacted.

(b) Except as provided in Subsection (d)—

1. the provisions of this Act shall not affect suits commenced prior to the date this Act takes effect, and

2. in all such suits proceedings shall be had, appeals taken, and judgments rendered, in the same manner and effect as if the Act had not been enacted.

(c) No suit, action, or other proceeding commenced by or against any officer in his official capacity as an officer of any department or agency whose functions are transferred by the Act shall abate by reason of enactment of the Act. No cause of action by or against any department or agency, functions of which are here transferred, or by or against any officer thereof in his official capacity shall abate by reason of the enactment of this Act. Causes of actions, suits, actions, or other proceedings may be asserted by or against the United States or such official as may be appropriate and, in any litigation pending when this Act takes effect, the court may at any time, on its own motion or that of any party, enter any order which will give effect to the provisions of the Act.

(d) If, before the date on which this Act takes effect, any department or agency, or officer thereof in his official capacity, is a party to a suit involving any function

of such department, agency, or officer transferred by this Act to the Administration, then such suit shall be continued as if this Act had not been enacted, with the Administration substituted.

(e) Final orders and actions of any official or component in the performance of functions transferred by this Act shall be subject to judicial review to the same extent and in the same manner as if there had been no transfer. Any statutory requirements relating to notices, hearings, action upon the record, or administrative review that apply to any function transferred hereby shall apply to the performance of those functions by the Administration, or any officer or component.

SEC. 112. With respect to any function transferred by the Act and performed after its effective date, reference in any other law (including reorganization plans) to any department or agency or any officer or office the functions of which are so transferred shall be deemed to refer to the Administration or officials thereof in which this Act vests such functions.

SEC. 113. Nothing herein shall be construed to limit, curtail, abolish, or terminate any function of the President which he had immediately before the effective date of the Act; or to limit, curtail, abolish, or terminate his authority to perform such function; or to limit, curtail, abolish, or terminate his authority to delegate, redelegate, or terminate any delegation of functions.

## TITLE VI

### FUNDING

SEC. 114. (a) There is hereby established in the Treasury of the United States a trust fund to be known as the Federal Energy Research, Development, and Demonstration Trust Fund (referred to herein as the "fund"). The fund shall consist of such amounts as may be credited or appropriated to it as provided in this section, and moneys so credited or appropriated are hereby made available to ERDDA for carrying out the purposes of this Act including the administration thereof, without fiscal year limitations.

(b) Commencing with the fiscal year ending June 30, 1974, and each fiscal year thereafter, all revenues (except so much thereof as may be already obligated under the provisions of other legislation such as Section 2(c)(2) of the Land and Water Conservation Fund Act of 1965 (16 U.S.C. 4601-5) due and payable during each such fiscal year to the United States for deposit in the Treasury as receipts from Federal lease sales of all energy sources, as well as royalties and other revenues derived from operations on, or the use of, such Federal leases, shall, up to \$2,000,000,000, be credited to the fund.

(c) In addition to the moneys credited to the fund pursuant to Subsection (b) of this section, there is authorized to be appropriated to the fund for the fiscal year ending June 30, 1974, and each fiscal year thereafter, such amount as is necessary to make the income of the fund \$2,000,000,000 for each such fiscal year.

(d)(1) It shall be the duty of the Secretary of the Treasury to manage the fund and (after consultation with appropriate officials of ERDDA) to report to the Congress not later than the first day of March of each year on the financial condition and the results of the operations of the fund during the preceding fiscal year and on its expected condition and operations during each fiscal year thereafter. Such report shall be printed as a Senate and House document of the session of the Congress to which the report is made.

(2) It shall be the duty of the Secretary of the Treasury to invest such portion of the fund as is not, in his judgment, required to meet current withdrawals. Such investments may be made only in interest-bearing obligations of the United States or in obligations guaranteed as to both principal and interest by the United States. For such purpose such obligations may be acquired (A) on original issue at the issue price, or (B) by purchase of outstanding obligations at the market price. The purpose for which obligations of the United States may be issued under the Second Liberty Bond Act, as amended, are hereby extended to authorize the issuance at par of special obligations exclusively to the fund. Such special obligations shall bear interest at a rate equal to the average rate of interest, computed as to the end of the calendar month next preceding the date of such issue, borne by all marketable interest-bearing obligations of the United States then forming a part of the public debt; except that where such average rate is not a multiple of one-eighth of 1 per centum, the rate of interest of such special obligations shall be the multiple of one-eighth of 1 per centum next lower than such average rate. Such special obligations shall be issued only if the Secretary of the Treasury determines that the purchase of other interest-bearing obligations of the United States, or of

obligations guaranteed as to both principal and interest by the United States on original issue or at the market price, is not in the public interest.

(3) Any obligation acquired by the fund (except special obligations issued exclusively to the fund) may be sold by the Secretary of the Treasury at the market price, and such special obligations may be redeemed at par plus accrued interest.

(4) The interest on, and the proceeds from the sale or redemption of, any obligations held in the fund shall be credited to and form a part of the fund.

## TITLE VII

### NUCLEAR ENERGY COMMISSION

SEC. 115. (a) The Atomic Energy Commission shall retain its functions pertaining to uranium and thorium reserve assessment, and its functions pertaining to the licensing and related regulatory functions of the Chairman and members of the Commission, the General Counsel, and other officers and components of the Commission performing such functions, which functions, officers, and components are not included in the transfer to the Administrator by section 108 above.

(b) The Atomic Energy Commission is hereby renamed the Nuclear Energy Commission.

## TITLE VIII

### EFFECTIVE DATE AND INTERIM APPOINTMENT

SEC. 116. The provisions of this Act dealing with title II (sections 103, 104, 105, and 106) shall take effect on the day of enactment. All other provisions shall take effect thirty days thereafter. Funds available to any department or agency (or any official or component thereof), any functions of which are transferred to the Administration by this Act, may, with the approval of the President, be used to pay the compensation and expenses of any officer appointed pursuant to this subsection until such time as funds for that purpose are otherwise available.

## TITLE IX

### DEFINITIONS AND ADMINISTRATIVE PROVISIONS

SEC. 117. (a) As used herein references to:

1. "function" or "functions" include references to duty, obligation, power, authority, responsibility, right, privilege, and activity, or the plural thereof, as the case may be;

2. "perform" or "performance" when used in relation to functions, include the exercise of power, authority, rights, and privileges;

3. "research and development" include all phases of Federal energy research, development, and demonstration, ranging from the conception of scientific and engineering principles appropriate for attaining a particular technological objective through the demonstration of their practical utility on a commercial scale, except to the extent they are for military purposes;

4. "demonstration" refer to that stage of a research and development program which typically follows the pilot plant stage and the objective of which is to establish the commercial feasibility of a particular process before it is put into commercial use;

5. "energy sources" include fossil fuels, geothermal energy, nuclear energy, solar energy, tidal energy, and other unconventional sources of energy;

6. "person" include any individual, association, institution, corporation, or other entity, any state or political subdivision, or agency or institution thereof, and any Federal department or agency;

7. "the Act" or "this Act" refer to the "Energy Research, Development, and Demonstration Act" enacted herein;

8. "the Administration" or "ERDDA" refer to "the Energy Research, Development, and Demonstration Administration" established herein; and

9. "fund" refer to the Federal Energy Research, Development and Demonstration Trust Fund established herein.

Any reference to any provision of law shall be deemed to include, as appropriate, references thereto as now or hereafter amended or supplemented.

(b) The Administrator is authorized to accept, hold, administer, and utilize gifts, and bequests of property, both real and personal, for the purpose of aiding or facilitating the work of the Administration. Gifts and bequests of money and proceeds from sales of other property received as gifts or bequests shall be deposited

in the Treasury and shall be disbursed upon the order of the Administrator. Property accepted pursuant to this section, and the proceeds thereof, shall be used as nearly as possible in accordance with the terms of the gift or bequest. For the purpose of Federal income, estate, and gift taxes, property accepted under this section shall be considered as a gift or bequest to the United States.

(c) The Administration shall cause a seal of office to be made of such device as the Board shall approve, and judicial notice shall be taken of such seal.

## TITLE X

### SEPARABILITY

SEC. 118. If any provisions of this Act, or the application thereof to any person or circumstance is held invalid, the remainder of the Act, and the application of such provision to other persons or circumstances shall not be affected thereby.

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## A BILL TO ESTABLISH AN ENERGY RESEARCH, DEVELOPMENT, AND DEMONSTRATION ADMINISTRATION

The attached proposed legislation is based on the conviction that a substantially increased centralized, and sustained energy research and development program, including demonstration, is indispensable to development of the nation's domestic energy sources, and thereby its energy self-sufficiency, through socially and environmentally accepted methods for producing, conserving and utilizing all forms of energy. Accomplishment of this vital effort requires a fresh new organization independent of existing organizations and procedures, and charged with overall and specific accountability for coordination, streamlined administration, and results.

The bill accordingly provides for the establishment of a new independent agency, the Federal Energy Research, Development, and Demonstration Administration ("ERDDA"). Responsibility is consolidated therein for coordinating and administering all existing, and for initiating, coordinating and administering extensive new, energy research and development functions and programs applicable to all forms of energy—except those undertaken for military purposes. Commensurate authority extends from overall policy planning and budget control, to all stages of particular projects, from initial conception through design, construction, operation and maintenance of commercial-sized demonstration plants, such operations to be carried on internally with ERDDA's own facilities, or by suitable arrangement with contract agencies.

A 15-member Board of Governors, composed of Government Officials qualified in energy and energy research and development, and of experts from the private sector, is responsible for overall supervision of ERDDA. The daily operations of ERDDA are to be directed by an "Administrator," who must be outstandingly qualified in those fields, and their management. He will serve as Chief Executive Officer responsible to the Board for carrying out the Board's policies consistent with the objectives and purposes of the Act.

To carry out this effort, the bill provides for funding through a special trust fund composed of receipts from Federal lease sales and all other sales or grants of development rights of energy sources on Federal lands, up to \$2 billion a year. The payments to the Federal Government for energy development rights thus earmarked for development of new energy sources would provide the sustained continuity indispensable to a project of this nature.

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[From the Congressional Record, Friday, July 13, 1973]

### STATEMENTS ON INTRODUCED BILLS AND JOINT RESOLUTIONS

By Mr. COOK (for himself, Mr. Robert C. Byrd, and Mr. Baker):

S. 2167. A bill to authorize the Secretary of the Interior to conduct research, development, and demonstration projects in the fields of energy sources and technologies. Referred to the Committee on Interior and Insular Affairs.

Mr. Cook. Mr. President, on Tuesday, July 10, I was pleased to join with my colleagues in a colloquy on the energy problems which this Nation faces. I be-

lieve most sincerely that in addition to focusing attention on these problems, we also have to come forward with sensible and workable solutions.

At the conclusion of my statement I again expressed my belief that we must solve our problem by the production and use of our domestic resources. I proposed that we expend every effort to improve our research and development efforts to a degree that we are no longer dependent on a foreign power for our energy fuels. In so doing we could insure our status as a world power.

I referred to the President's second energy statement as well as various pieces of legislation before the Congress.

The President has now concluded that the present program for funding energy R. & D. is not adequate. There are many of us who have held this view for some time and I am pleased to see this new approach the President is now taking. His announcement that \$10 billion should be funded for energy R. & D. over the next 5 years beginning in 1975 follows very closely the proposal contained in Senator Jackson's bill, S. 1283, of which I am a cosponsor.

S. 1283 would establish a national program for Research, Development and Demonstration in Fuels and Energy and for the coordination and financial supplementation of Federal energy research and development. The bill would cost \$20 billion over a 10-year period.

Mr. President, regardless of the course we decide to follow I believe that the objective can be achieved only if there is assured financing over a continuing period. If we permit the R. & D. program to be dependent on an annual appropriation we most certainly risk attainment of our goal. The question then arises as to how this assured and continued funding can best be provided.

In 1956, when the decision was made to undertake the construction of 40,000 miles of super interstate highways we recognized that in so doing we were tackling the greatest construction project in the history of man. We recognized further that to achieve our goal that we must have assured funding over a continuing period. We realized that we must remove the uncertainties inherent in dependence on annual appropriations. The decision was made by the 84th Congress and President Eisenhower to establish a Highway Trust Fund for this purpose. Public Law 627 came into being. The fund derived its assets from taxes paid on fuels, tread rubber, tires, tubes, buses, trucks, and other highway use sources. In this way the user paid the cost of the highway. We now enjoy a highway network which I question would exist had we not created this fund. As we seek the best solution to funding required R. & D. programs for energy. I think we would do well to consider our previous action.

The requirement exists for assured and continuous funding of our R. & D. program. What better way to provide this funding than the creation of a Federal Energy Research and Development Trust Fund. This fund could act as a repository for funds of a prescribed amount and expenditure could be made from the fund to meet requirements as they occurred over a continuous time period. I suggest a sum of \$2 billion would be paid into the fund annually. I would not restrict or require that a specific amount be expended over an fiscal year and would permit the administration to expend the available funds over a continued period to meet requirements. Experience has shown that R. & D. projects usually begin with small initial funding requirements and their requirements over succeeding periods are dictated by their success or failure.

In suggesting \$2 billion as an annual sum I realize that this amount is a quantum jump in R. & D. expenditure. For the period fiscal year 1970; fiscal year 1974 only \$2.753 billion was funded. These figures were included in the President's first energy message, and I ask unanimous consent that a copy be printed in the Record.

There being no objection, the tables were ordered to be printed in the Record, as follows:

FEDERAL ENERGY R. & D. FUNDING

Agency	Fiscal year 1970	1971	1972	1973	1974
<b>Coal:</b>					
Resources development.....	30.4	49.0	73.5	94.5	119.9
Production and utilization R. & D. including gasification, liquefaction, and MHD. DOI, OCR.....	13.5	18.8	30.3	43.5	52.5
DOI, BOM.....	13.2	15.4	14.7	19.8	18.1
Mining health and safety research..... DOI, BOM.....	3.7	14.8	28.5	31.2	28.3
Interior central fund (part)..... DOI.....					21.0

## FEDERAL ENERGY R. &amp; D. FUNDING—Continued

Agency	Fiscal year 1970	1971	1972	1973	1974
Petroleum and natural gas.....	8.8	11.5	12.9	12.8	9.1
Petroleum extraction technology..... DOI, BOM.....	2.7	2.7	3.2	3.1	3.1
Nuclear gas stimulation..... AEC.....	3.7	6.1	7.1	7.2	4.0
Oil shale..... DOI, BOM.....	2.4	2.7	2.6	2.5	2.0
Nuclear fission.....	283.4	295.2	358.0	412.0	475.4
Liquid metal fast breeder reactor..... AEC.....	144.3	167.9	236.0	269.0	320.0
Other civilian nuclear power..... TVA.....			.2	3.0	3.0
Nuclear materials process development..... AEC.....	108.5	96.6	86.8	98.0	90.5
Nuclear materials process development..... AEC.....	30.6	30.7	35.0	42.0	61.9
Nuclear fusion.....	37.5	42.2	52.8	65.5	88.5
Magnetic confinement..... AEC.....	34.3	32.2	33.3	39.6	47.3
Laser..... AEC.....	3.2	10.0	19.5	25.9	41.2
Solar energy..... NSF.....			1.7	4.2	12.2
Geothermal energy.....	.2	.2	1.4	3.4	4.1
NSF.....			.7	.7	1.4
DOI-GS.....	.2	.2	.7	2.5	2.5
DOI-BOM.....				.2	.2
Electrical generation, transmission and storage.....		1.3	2.2	4.9	4.1
NSF.....		.5	1.3	2.4	.9
DOI.....		.8	.9	1.0	1.0
AEC.....				1.5	2.2
Control technology (stationary sources).....			28.6	38.1	47.5
Air pollution control technology..... EPA.....	19.8	17.4	24.5	29.5	21.5
SOX removal..... TVA.....			1.1	3.0	18.0
Thermal effects..... EPA.....	.8	.6	.7	1.0	1.0
Thermal effects..... AEC.....	1.5	1.8	2.3	4.6	7.0
Miscellaneous.....			6.3	6.9	11.0
Systems and resource studies..... NSF.....			4.4	5.3	5.3
Energetics research..... NSF.....			1.9	1.6	1.7
Interior central fund (part)..... DOI.....					4.0
Total research and development.....	382.4	419.2	537.4	642.3	771.8
AEC.....	326.1	345.3	420.0	487.8	574.1
EPA.....	20.6	18.0	25.2	30.5	22.5
NSF.....		.5	10.0	14.2	21.5
DOI.....	35.7	55.4	80.9	103.8	132.7
TVA.....			1.3	6.0	21.0

Agency codes: AEC—Atomic Energy Commission; DOI, BOM—Department of the Interior, Bureau of Mines; DOI, GS—Department of the Interior, Geological Survey; DOI, OCR—Department of the Interior, Office of Coal Research; NSF—National Science Foundation; TVA—Tennessee Valley Authority.

Mr. Cook. In analyzing these figures it is interesting to note that \$2.110 billion or 76.6 percent of this total was funded for atomic energy. The remaining sum—\$642 million was divided over all other R. & D. projects related to energy.

I take no issue with the amount funded for atomic energy as I believe that we will benefit from this important program. I do regret the paucity of funds—\$642 million—which has been shared over the past 5 years by programs related to: coal, oil, gas, geothermal, solar, and other miscellaneous systems. We must correct this deficiency. I believe that the establishment of a fund in the amounts suggested will meet this requirement.

Let us consider the source of these funds. I again suggest the user approach. However, rather than revenue from the tax placed on the user I suggest that we utilize the revenue from the assets of the user. In this instance the user is most certainly the public—you and I. And the asset of which I speak is our public land and more specifically that public land which lies on the Outer Continental Shelf—OCS. For many years we had these assets but we did not consider them to be of any great value because the supply far exceeded the demand.

Today we find that these OCS assets have indeed increased in value. The irony in this increase is that it has come about by an energy shortage, particularly

oil and gas, which threatens to destroy many of our much more tangible and recognizable assets.

The revenue comes to us through the lease bonuses paid by the energy industry for permission to explore for and produce oil and gas from our public land. The use of funds collected by the Government in our interest from the energy industries for the use of our land would seem to me to be a most logical source of funds for Government funded R. & D. programs to solve our energy problem. Projections for the adequacy of such funds seem most favorable.

I have received information concerning the OCS lease sales and request that it be printed in the Record at this point.

There being no objection, the table was ordered to be printed in the Record, as follows:

OUTER CONTINENTAL SHELF LEASE SALES

Year	Leased tracts	Acres	Bonus (millions)	1st-year rentals (millions)
1968.....	197	934,167	\$1,346	\$3.0
1969.....	40	114,283	112	1.1
1970.....	136	591,040	944	2.1
1971.....	11	37,222	96	.4
1972.....	178	826,195	2,251	2.5
1973 <sup>1</sup> .....	104	600,000	1,598	1.8
Total.....	666	3,102,907	6,347	10.9

<sup>1</sup> Preliminary estimates. O. & G. Journal, June 25, 1973. In addition a lease sale of about 800,000 acres is scheduled for December 1973.

Mr. Cook. If we take the period of calendar year 1968-72 and the first few months of 1973 we find that \$6.347 billion have been collected in lease bonus payment by the energy industry. This is considerably more than was expended for the R. & D. during a similar period. I also remind the Congress that the President has announced his intention to increase by threefold our previous lease sales and has announced one additional lease sale of considerable size for December of this year. Judging from the acreage involved the revenue from this sale could well exceed \$1 billion. This total sum for this year would be over one-half billion in excess of that required to support the funding for the proposed trust fund.

Mr. President, on July 10, 1973, I announced my intention to propose legislation to provide the necessary funds for energy research and development. I am today introducing a bill for Senator Baker of Tennessee, Senator Robert C. Byrd of West Virginia, and myself to establish in the Treasury of the United States a trust fund to be known as the "Federal Energy Research and Development Trust Fund" and ask unanimous consent that the text be printed in the Record at the conclusion of my remarks.

The ACTING PRESIDENT pro tempore. Without objection, it is so ordered. (See exhibit 1.)

Mr. Cook. Commencing with the year ending June 30, 1974, and each fiscal year thereafter, all revenues up to \$2 billion except as otherwise obligated, due and payable during each such fiscal year to the United States for deposit in the Treasury as miscellaneous receipts under the Outer Continental Shelf Lands Act shall be credited to the Fund. In the unlikely event the leasing program does not generate sufficient funds: sufficient funds would be authorized as necessary to make the annual income of the Fund \$2 billion.

In announcing his cosponsorship of this bill Senator Baker suggested that an attempt be made to broaden the base of contributions to this Fund and that one possible method might be incorporated in a user's utility tax. He further stated that he intends to offer something concrete along these lines in the near future. I welcome Senator Baker's suggestion as I believe that it has considerable merit. It follows very closely the intent of the bill in that the Fund would be supported by the user. I believe that this matter could be considered in detail by the committee to which it is referred, and I so recommend. Certainly we would want to make an ample provision for the necessary funds.

It is my intent that the Secretary of the Interior or, if the Congress so chooses, the Secretary of the Department of Energy and Natural Resources, would use the Fund to conduct research, development, and demonstration projects.

I might suggest at this point, Mr. President, that it might even be considered, in the event the trust were to be established to the full extent, that if it were



necessary, the Federal Government could even go into the business, as we did in the atomic energy crisis, and as we did in the NASA crisis, as we did prior to World War II and during the course of World War II, and that if it is necessary it might even be considered that it would be prudent to the extent that the Federal Government would go into the business of the establishment of refineries, the establishment of pipelines, or whatever was necessary to solve and create a logical energy program for the United States, so that we would not be dependent on foreign sources.

Therefore, Mr. President, on this basis, the Government could enter into contracts and agreements with any person for conduct by such persons of these projects in all fields of energy sources and technologies.

Mr. President, the 93d Congress is making progress in solving our energy problems. I urge that it continue this progress and support the passage of this bill.

#### EXHIBIT 1

#### S. 2167

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the Secretary of the Interior is authorized, utilizing moneys in the Fund established by section 2 of this Act, to conduct research, development, and demonstration projects in, and to enter into agreements with any person for the conduct by such person of research, development, and demonstration projects in, the fields of energy sources and technologies. In carrying out the provisions of this Act, the Secretary of the Interior is authorized to make grants, and to enter into contracts, leases, or other arrangements.

(b) As used in this section, the term—

(1) "energy sources" includes fossil fuels, geothermal energy, nuclear energy, and solar energy, tidal energy, and unconventional sources of energy; and

(2) "person" includes any individual, association, institution, corporation, or other entity, any State or political subdivision, or agency or institution thereof, and any Federal department or agency.

SEC. 2. (a) There is hereby established in the Treasury of the United States a trust fund to be known as the "Federal Energy Research and Development Trust Fund" (hereafter referred to in this section as the "Fund"). The Fund shall consist of such amounts as may be appropriated or credited to it as provided in this section. Moneys credited or appropriated to the Fund pursuant to this section are hereby made available to the Secretary of the Interior for carrying out the purposes of this Act without fiscal year limitations.

(b) Commencing with the fiscal year ending June 30, 1974, and each fiscal year thereafter, all revenues (except so much thereof as may be obligated under the provisions of section 2 (c) (2) of the Land and Water Conservation Fund Act of 1965 (16 U.S.C. 4601-5)) due and payable during each such fiscal year to the United States for deposit in the Treasury as miscellaneous receipts under the Outer Continental Shelf Lands Act shall, up to \$2,000,000,000, be credited to the Fund.

(c) In addition to the moneys credited to the Fund pursuant to subsection (b) of this section, there is authorized to be appropriated to the Fund, for the fiscal year ending June 30, 1974, and each fiscal year thereafter, such amount as is necessary to make the income of the Fund \$2,000,000,000 for each such fiscal year.

(d) (1) It shall be the duty of the Secretary of the Treasury to manage the Fund and (after consultation with the Secretary of the Interior) to report to the Congress not later than the first day of March of each year on the financial condition and the results of the operations of the Fund during the preceding fiscal year and on its expected condition and operations during each fiscal year thereafter. Such report shall be printed as Senate document of the session of the Congress to which the report is made.

(2) It shall be the duty of the Secretary of the Treasury to invest such portion of the Fund as is not, in his judgment, required to meet current withdrawals. Such investments may be made only in interest-bearing obligations of the United States or in obligations guaranteed as to both principal and interest by the United States. For such purpose such obligations may be acquired (A) on original issue at the issue price, or (B) by purchase of outstanding obligations at the market price. The purposes for which obligations of the United States may be issued under the Second Liberty Bond Act, as amended, are hereby extended to authorize the issuance at par of special obligations exclusively to the Fund.

Such special obligations shall bear interest at a rate equal to the average rate of interest computed as to the end of the calendar month next preceding the date of such issue, borne by all marketable interest-bearing obligations of the United States then forming a part of the Public Debt; except that where such average rate is not a multiple of one-eighth of 1 percent, the rate of interest of such special obligations shall be the multiple of one-eighth of 1 percent next lower than such average rate. Such special obligations shall be issued only if the Secretary of the Treasury determines that the purchase of other interest-bearing obligations of the United States, or of obligations guaranteed as to both principal and interest by the United States on original issue or at the market price, is not in the public interest.

(3) Any obligation acquired by the Fund (except special obligations issued exclusively to the Fund) may be sold by the Secretary of the Treasury at the market price, and such special obligations may be redeemed at par plus accrued interest.

(4) The interest on, and the proceeds from the sale or redemption of, any obligations held in the Fund shall be credited to and form a part of the Fund.

Mr. ROBERT C. BYRD. Mr. President, will the Senator yield?

Mr. COOK. I yield.

Mr. ROBERT C. BYRD. Mr. President, I congratulate my distinguished friend from Kentucky (Mr. Cook) on the foresight that he is demonstrating in introducing this legislation.

We in this country have been living in an energy-cheap era. We have been wasteful, we have been thoughtless, and we have lacked the vision and foresight that we should have shown, and are paying for it dearly now and will continue to do so. For too long administrations—Democratic and Republican—have failed to budget sufficient moneys for energy research, and particularly in connection with coal. The problems we are having in the 1970's derive in great measure from the fact that we failed to act in the 1960's to provide adequate funds for coal, oil, and gas research.

As a member of the Senate Appropriations Committee, for 15 years I have sought to secure increased appropriations for coal research. When I was a Member of the other body, and served there with my distinguished friend the junior Senator from Montana (Mr. Metcalf)—who is now presiding over this august body—we sought to establish an Office of Coal Research, and after several years of persistent efforts, Congress enacted legislation to provide such an office. But the administrations, as I say, both under Democratic leadership and under Republican leadership, have in my judgment failed over the years to provide the necessary funding requests to adequately deal with the energy problem through research.

It is true, as the distinguished Senator from Kentucky pointed out, there has been a considerable amount of money spent in the nuclear energy field, but coal, the most bountiful fossil fuel resource we have in this country, has consistently come up on the low end of the totem pole. There has long been a serious imbalance in funding for research in the energy field. Over the years, I have tried to add moneys for coal research in appropriation bills. It has been like trying to wring water out of a dry towel—a drop here and a drop there—we get a little money from the subcommittee, and then the full committee. It comes to the Senate. It goes to conference and there it gets cut in half. It has been a severe trial to try to add moneys for coal research when the administration fails to request sufficient funds for such in the budget. The very best we can do is too little.

I believe that the able Senator from Kentucky has come up with an idea here which, patterned after the highway trust funds which have been so successful and without which we would not today have the broad network of excellent interstate highways in this country, will provide adequately for the funding of energy research. I want to congratulate him. I appreciate his adding my name as a cosponsor. I trust that we will have the support of other Senators for the legislation.

I hope that the legislation the Senator from Kentucky has introduced will receive speedy hearings and expeditious action.

Mr. COOK. Mr. President, I want to thank the distinguished Senator from West Virginia. Through the efforts of the distinguished Senator from West Virginia in his position as a Senator from West Virginia and his position on the Appropriations Committee, the funds for the Office of Coal Research this year are \$113 million, which is almost twice the amount the administration requested.

The point I am trying to make is that the Senator from West Virginia has helped me ever since I came here. The Institute for Surface Mining, established

at Berea College in Kentucky, is the only institute of its kind in the United States. We have been able, by hard work, to get it funded at an approximate level of \$300,000 a year, yet it has been used in almost every coal State in the United States, including the State of the distinguished Senator from Montana (Mr. Metcalf), now the Presiding Officer of the Senate.

I might also say that it was through the efforts of the senior Senator from West Virginia, in approximately 1955 or 1956, that the first money was put in the budget for coal gasification and the institute was established and started work on coal gasification. Yet because it was a budget item that had to be renewed on a year-to-year-to-year basis, within 2 years it was dropped from the budget. The project was stopped. We lost all that time between 1956 and now on coal gasification, coal liquification, and desulfurization of coal.

Look where we are now. I might say that both Senators from West Virginia (Mr. Randolph and Mr. Robert C. Byrd) have been working on this matter far longer than I have. So that I can only say there is only one way to get rid of this frustration that we have to fight every year, and that is by the establishment of a trust so that we know there can be continuing and ongoing funds available, so that we do not have to fight every year for coal research to try to solve the various problems that need to be faced in the energy field.

MR. ROBERT C. BYRD. I again compliment the Senator from Kentucky. It has indeed been frustrating to try to squeeze out a dollar here and a dollar there for coal research. I was able through great effort to secure moneys to establish a pilot plant to produce high-octane gasoline at Cresap, in Marshall County, W. Va. It was a pilot plant, costing \$10 million to \$12 million. Its purpose originally was to conduct research in the effort to produce high-octane gasoline from coal. I think we achieved our goal. At least it was proved that such gasoline can be produced from coal at prices that are almost competitive with other fuels. But the plant has been in mothballs now for some time. Yet, the country needs a low-sulfur-content fuel oil and this plant could be utilized for that purpose. The Department of the Interior is supporting the use of this plant for that purpose. I feel that it soon will be put to that use.

But we continue to spend billions of dollars for oil coming to our country from overseas which affects our balance of payments adversely, which affects our balance of trade adversely, whereas if we could spend a comparatively few pennies here, if we had spent a comparative few dollars 10 years ago, a few dollars in comparison with the high cost of importing oil coming into this country now, we would not now have this trade deficit, we would not now have such a balance-of-payments deficit, and we would not have to lean on other countries for the energy so important to our security. We would not have the problems in our own country with respect to blackouts, brownouts, and the other energy shortages that we are confronted with today and which we will be increasingly confronted with for a while.

I congratulate the Senator from Kentucky again. He has demonstrated tremendous foresight and I hope that the Senate will act favorably and soon on this legislation.

Mr. Cook. May I associate myself with the remarks of the Senator from West Virginia.

Mr. President, it is an amazing situation we find ourselves in in this country that 6 percent of the world's population is now using between 35 and 40 percent of the world's fossil fuel resources. We now use 5 million barrels a day of imported crude oil. It does not take anyone long to figure out that a 42-gallon barrel—all we have to do is take a 42-gallon barrel and multiply it 5 million times, and if we continue at the rate we are increasing now, and we are increasing our utilization by 4.5 percent a year, that means that unless we do something between now and 1985, we will be importing into this country 15 million barrels of crude oil a day.

We cannot let that happen to this Nation. We have got to have a program. It is amazing that we have watched the increase in prices of various fuels and various items of fuel, yet we find out that one of the increases is a direct result of the competitive element of bidding for leases from the U.S. Government and one of the major costs that has to be put on the books by the companies is the fantastic result of the millions and millions of dollars that they have to bid for the leases and the money goes into the Treasury instead of into a trust fund to solve our energy problems.

MR. ROBERT C. BYRD. It is a repetition of the old story, "For want of a nail, the shoe was lost. For want of a shoe, the horse was lost. For want of a horse, the rider was lost."

Mr. COOK. I thank the Senator from West Virginia.

The ACTING PRESIDENT pro tempore. The time of the Senator has expired.

Mr. STEVENS. Mr. President, I have a feeling that one of the reasons we have the opposition to the off shore drilling is that the States that are on the shore with the proposed activity have no interests. I have not seen the Senator's proposal and I wonder whether it contains any concept of payments to the States, affected by the increased activity offshore as we do in connection with the development of public lands or development of the forests in counties where they are located.

Mr. COOK. To answer the Senator's question bluntly, it does not. But we gave that serious consideration, and I would hope that the Senator from Alaska would hope that the Senator from Alaska would pursue it. If he feels that there should be a particular percentage, because of the tug of war that has gone on through the years between the Federal Government and the respective States relative to offshore drilling, I hope he would collaborate with this Senator at least, in trying to find a percentage or trying to find a formula by which a percentage of the trust would be utilized for the State of Alaska, the State of Florida, the State of Louisiana, the State of Texas, the respective eastern shore States and Western shore States, to resolve the problem that the Senator from Alaska presents.

Mr. STEVENS. I would be happy to work with the Senator from Kentucky on that.

In connection with the developments of the offshore drilling in the Cook Inlet, where there are now a series of platforms that are producing oil and gas from under the Cook Inlet, we can demonstrate fully the impact of those operations on both the State and what we call the borough, and what the Senator would call the county governments, and the city governments in the area; the cost of schools; increased roads, docks, and everything else associated with that development—all of which comes out of those local governments—and they have no associated income if the drilling is outside the State's jurisdiction. I would be pleased to work with the Senator on that.

I do not think Maryland or the east coast is going to allow drilling off the east coast until they can see that it is in their financial interest to do so, because of the fantastic cost associated today in connection with environmental protection.

I think the Senator has a good proposal, and I am happy that I was here when he presented it. But I think we are going to have to do something to protect the interests of the States and local governments involved.

Mr. COOK. I thank the Senator from Alaska for raising the point, because we did raise it in our discussions. At that stage of the game, we had the information we really wanted for the establishment of the trust. I say to the Senator that we had no way of pinpointing a percentage. We had no way of determining logically and with sound reasoning an equitable formula. I think we can move in that direction, and we should. I am delighted that the Senator from Alaska raised that point.

Mr. STEVENS. I thank the Senator.

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STATEMENT BY SENATOR COOK BEFORE THE GOVERNMENT OPERATIONS COMMITTEE CONCERNING ERDA, DECEMBER 5, 1973

Mr. Chairman, recently in an editorial, a well known commentator stated that although it sounded perverse, he found himself half hoping that the Arabs would cut off, not five percent, but all oil to the United States. He reasoned that when it had to, the United States is capable of miracles, and while the cutoff now would merely provide us with a miserable winter, that the crisis would provide us with a necessary incentive which seems to be lacking by the people and its leaders to provide and implement the necessary programs so that this Nation would no longer be dependent on a foreign power for its energy fuels. He was fifty percent right in that the Arabs have embargoed oil shipments to the United States. I think he may make the other fifty percent as we will solve this problem.

While I am much concerned over the hardship that some of the people of this Nation will face as a result of our situation today, I am nevertheless in sympathy with this comment, as I believe it has taken this crisis to shock the people, the Congress, and the president into taking action which is long overdue.

I am also in complete agreement with the President's recent comment:

"Whenever the American people are faced with a clear goal and they are challenged to meet it we can do extraordinary things."

The challenge is very clear. We must find ways to produce and to use the abundant domestic natural resources with which nature has provided us so that we are no longer dependent on foreign powers for our energy fuels. We must accept these natural resources in the form in which they exist—not in the form in which we wish they existed. It is our problem to effect the desired conversion from so-called “dirty” fuel to clean fuel and to harness the many energy forces of nature. In this way we can meet our energy requirements. However, I hasten to add that in so doing, we must not sacrifice our goals of establishing and maintaining a healthful environment for all the people of this Nation. This is not an impossible task, and we are taking important, if belated and minimal steps to see that this is accomplished.

Mr. Chairman, to me such a goal can be achieved only through a dynamic research and development program. To this end, on July 13, of this year for myself, Mr. Robert C. Byrd, and Mr. Baker, I introduced S. 2167, which would establish such a program, but more importantly it would provide adequate funding for this program by the establishment of an energy research and development trust fund. I am convinced that if we permit the research and development program to be dependent on annual appropriations, we must certainly risk attainment of our goal.

To me the situation is comparable to that which we faced in 1956 when the decision was made to undertake the construction of more than forty thousand miles of super inter-state highways. We recognized then that in order to achieve our goal we must have assured funding over the continuing period. We realized that we must remove the uncertainties inherent in dependence on annual appropriations. The decision was made by the 84th Congress and President Eisenhower to establish a highway trust fund for this purpose. Public Law 627 came into being. We now enjoy a highway network which I question would exist had we not created this fund. As we seek the best solution to funding required research and development energy programs, I think we would do well to consider this example.

On November 13, following the announcement by the President that he was recommending to the Congress the establishment of an independent agency, the Energy Research and Development Administration, to manage our energy research and development efforts, I introduced for myself, Mr. Baker and Mr. Bartlett, S. 2694, a bill to establish the energy research development, and demonstration administration. This proposal differs from the President's proposal, which was subsequently introduced by Mr. Ribicoff and is the bill which we are considering here today, S. 2744, in that it provided specifically, not only for research and development, but also for the very important demonstration phase. From my own personal experience, I have found that when the research and development phase has been reached there has not been adequate provision for the demonstration phase to prove or disapprove, with a larger model, the validity of the research and development which has been completed. As I study S. 2744, and its companion bill in the House, H.R. 11510, I note that while demonstration is not included in the title of the bill, it is provided for adequately within the bill itself. I also understand that it will be included with the House report. I therefore take no real issue with this particular point, only to say that demonstrations are vital to the success of energy development programs, and without adequate provision for this phase, the program itself is incomplete.

There is also a difference in my bill concerning the actual organization and functioning of the administration itself. This difference stems basically from your determination that it is more desirable for the ERDA to have an advisory board rather than a board of governors as provided in S. 2694. Here again, I take no real issue and I believe this is a detail which can be worked out to the agreement of all concerned.

There is also the consideration of the exact placement of nuclear weapons research. In my bill I have not included this type of research. However, I can see a very good reason for doing so if it is the desire to remove from the Atomic Energy Commission all research and development activity, and leave only those functions concerning licensing and related regulatory measures.

There is, however, one basic and very important, and to me a vital difference in the bills we have been discussing. As I stated earlier, I hold that we need the energy trust fund. Without such fund our energy research would be built on a very chancy proposition. It would be subject to the whims and the desires of each successive Congress, and as such it would be hampered severely in its efforts to provide us with the answers to our problems.

I think we all accept the proposition that we need a dynamic research and development program or we would not be here discussing it today. As anyone, who has been involved in major research and development programs will tell you, success is dependent on assured and continuous funding. Therefore, I say to my colleagues, what better way to provide this funding than the creation of a federal energy research and development trust fund. This fund could act as a repository for funds of a prescribed amount and expenditure from the fund could be made to meet requirements as they occur over a continuous time period. I suggest a sum of two billion dollars would be paid into the fund annually. I would not restrict or require that a specific amount be expended over a particular fiscal year to support a particular program. Such determination would be made by the administrator to permit him to expend funds to meet requirements. It is vital to our purpose that we are prepared to support a scientific or technological breakthrough as it occurs and without reference to specific limitation imposed by a system of corporations.

In suggesting \$2 billion as an annual sum I realize that this amount is a quantum jump in R & D expenditure. For the period fiscal year 1970; fiscal year 1974 only \$2,753 billion was funded. These figures were included in the President's first energy message, and I ask unanimous consent that a copy be printed in the record. (Enclosure 1)

In analyzing these figures it is interesting to note that \$2.110 billion or 76.6 percent of this total was funded for atomic energy. The remaining sum—\$625 million was divided over all other R & D projects related to energy.

I take no issue with the amount funded for atomic energy as I believe that we will benefit from this important program. I do regret the paucity of funds—\$625 million—which has been shared over the past five years by programs related to: coal, oil, gas, geothermal, solar and other systems. We must correct this deficiency. I believe that the establishment of a fund in the amounts suggested will meet this requirement.

Now let's consider the source of these funds. I again suggest the user approach as was adopted for the successful highway trust fund. However, rather than revenue from the tax on oil, gasoline and other goods and services placed on the user I suggest that we utilize the revenue from the assets of the user. In this instance the user is most certainly the public—you and I. And the asset of which I speak is our public land and more specifically that public land which lies on the outer continental shelf—OCS. For many years we have had these assets but we did not consider them to be of any great value because the cost of producing fuel far exceeded the price which it could command in the market place.

Today in a fuel deficient market we find that these OCS assets have indeed increased in value. The irony in this increase is that it has come about by an energy shortage, particularly the shortage of oil and gas, which threatens to destroy many of our much more tangible and recognizable assets and reduce our standard of living.

The revenue comes to us through the lease bonuses paid by the energy industry for permission to explore for and produce energy fuels from our public land. The use of funds collected by the Government in our interest from the energy industries for the use of our land would seem to me to be a most logical source of funds for government funded R & D programs to solve our energy problem. Projections for the adequacy of such funds seems most favorable.

I have received information concerning the OCS lease sales alone and request that it be printed in the record at this point. (Enclosure 2)

If we take the period of calendar year 1968-72 and the first few months of 1973 we find that \$6.347 billion have been collected in lease bonus payment by the energy industry. This is considerably more than was expended for the R & D during a similar period. I also remind the Congress that the President has announced his intention to increase by three-fold our previous lease sales and has announced one additional lease sale of considerable size for this month. Judging from the acreage involved the revenue from this sale could well exceed \$1 billion. This total sum for this year would be over one-half billion in excess of that required to support the funding for the proposed trust fund.

While the income from the outer continental shelf would be adequate in itself, I would also include the receipts from Federal lease sales and all other sales or grants of development rights of energy sources on Federal lands. In this way, I am convinced that we would have more than adequate source of funds to meet our requirements.

Mr. Chairman, before leaving this subject, I would like to recognize that when S. 1283 was introduced by Senator Jackson as an energy conservation measure, I co-sponsored the bill. On review, however, I find this bill makes no permanent requirement for funding. Thus leaving it to the Congress to appropriate at any level of funding after the first year or at no level of funding at all. In addition, it fails to contain the very important element of creating a separate agency to manage our total research and development effort and limits funds to specific projects. Such limitations would defeat the flexibility and responsiveness so necessary in this type legislation. I therefore cannot support S. 1283.

In conclusion, Mr. Chairman, I am encouraged that this committee is conducting these hearings on the vital issue of establishing ERDA with or without the extra "D" in the name but most certainly with adequate provision for demonstration. I hope most sincerely that you will take that extra and vital step of including a trust fund to insure that the administrator of ERDA will have available the necessary funds over a continuing period of time to enable him to accomplish the task ahead.

Let me close on an encouraging note: The unity of this nation has been fragmented by events of the past few months. I now see concrete evidence that the people are becoming unified by the impact that the energy crisis is having on them as individuals and on the Nation itself. Let us hope that from the hardships we will be facing this winter, that a stronger, better and a more unified Nation will emerge and that by our efforts here that we will have made a significant contribution to this unification.

[Enclosure 1]

FEDERAL ENERGY R. & D. FUNDING

Agency	Fiscal year 1970	1971	1972	1973	1974
<b>Coal:</b>					
Resources development.....	30.4	49.0	73.5	94.5	119.9
Production and utilization R. & D. including gasification, liquefaction, and MHD. DOI, OCR.....	13.5	18.8	30.3	43.5	52.5
Mining health and safety research..... DOI, BOM.....	13.2	15.4	14.7	19.8	18.1
Interior central fund (part)..... DOI.....	3.7	14.8	28.5	31.2	28.3
					21.0
<b>Petroleum and natural gas.....</b>					
	8.8	11.5	12.9	12.8	9.1
Petroleum extraction technology..... DOI, BOM.....	2.7	2.7	3.2	3.1	3.1
Nuclear gas stimulation..... AEC.....	3.7	6.1	7.1	7.2	4.0
Oil shale..... DOI, BOM.....	2.4	2.7	2.6	2.5	2.0
<b>Nuclear fission.....</b>					
	283.4	295.2	358.0	412.0	475.4
Liquid metal fast breeder reactor..... AEC.....	144.3	167.9	236.0	269.0	320.0
Other civilian nuclear power..... TVA.....			.2	3.0	3.0
Nuclear materials process development..... AEC.....	108.5	96.6	86.8	98.0	90.5
	30.6	30.7	35.0	42.0	61.9
<b>Nuclear fusion.....</b>					
	37.5	42.2	52.8	65.5	88.5
Magnetic confinement..... AEC.....	34.3	32.2	33.3	39.6	47.3
Laser..... AEC.....	3.2	10.0	19.5	25.9	41.2
<b>Solar energy.....</b>					
			1.7	4.2	12.2
<b>Geothermal energy.....</b>					
	.2	.2	1.4	3.4	4.1
			.7	.7	1.4
	.2	.2	.7	2.5	2.5
			.2	.2	.2
<b>Electrical generation, transmission and storage.....</b>					
		1.3	2.2	4.9	4.1
		.5	1.3	2.4	.9
		.8	.9	1.0	1.0
				1.5	2.2
<b>Control technology (stationary sources).....</b>					
			28.6	38.1	47.5
Air pollution control technology..... EPA.....	19.8	17.4	24.5	29.5	21.5
SOX removal..... TVA.....			1.1	3.0	18.0
Thermal effects..... EPA.....	.8	.6	.7	1.0	1.0
	1.5	1.8	2.3	4.6	7.0

## FEDERAL ENERGY R. &amp; D. FUNDING—Continued

Agency	Fiscal year 1970	1971	1972	1973	1974
Miscellaneous.....			6.3	6.9	11.0
Systems and resource studies..... NSF.....			4.4	5.3	5.3
Energetics research..... NSF.....			1.9	1.6	1.7
Interior central fund (part)..... DOI.....					4.0
Total research and development.....	382.4	419.2	537.4	642.3	771.8
AEC.....	326.1	345.3	420.0	487.8	574.1
EPA.....	20.6	18.0	25.2	30.2	22.5
NSF.....		.5	10.0	14.2	21.5
DOI.....	35.7	55.4	80.9	103.8	132.7
TVA.....			1.3	6.0	21.0

Agency codes: AEC—Atomic Energy Commission; DOI, BOM—Department of the Interior, Bureau of Mines; DOI, GS—Department of the Interior, Geological Survey; DOI, OCR—Department of the Interior, Office of Coal Research; NSF—National Science Foundation; TVA—Tennessee Valley Authority.

[Enclosure 2]

## OUTER CONTINENTAL SHELF LEASE SALES

Year	Leased tracts	Acres	Bonus (millions)	1st-year rentals (millions)
1968.....	197	934,167	\$1,346	\$3.0
1969.....	40	114,283	112	1.1
1970.....	136	591,040	944	2.1
1971.....	11	37,222	96	.4
1972.....	178	826,195	2,251	2.5
1973 <sup>1</sup> .....	104	600,000	1,598	1.8
Total.....	666	3,102,907	6,347	10.9

<sup>1</sup> Preliminary estimates. O. & G. Journal, June 25, 1973. In addition a lease sale of about 800,000 acres is scheduled for December 1973.

## STATEMENT BY SENATOR MARLOW W. COOK, BEFORE THE SENATE COMMERCE COMMITTEE

Mr. President, this Nation needs natural gas.

It needs this natural gas now, and it needs it in volumes which are sufficiently large to meet the requirements of the people of this land to heat their homes, cook their food, operate their commercial establishments, and build their industry.

I would hope that throughout these hearings and our subsequent deliberations that we keep this one thought upper most in our minds. We need natural gas.

This shortage of natural gas is not a situation which may happen six months from now, but rather one which is happening today. If anyone in this audience does not believe that this shortage is real, I wish that he could have been in my office last week when 28 members of the community of Somerset, Kentucky, met with me to express their very real concern for the threatened loss of 3,000 jobs in their community which will materialize this fall if more natural gas is not made available now.

The tragedy here is that we have seen this problem coming for several years. We proposed legislation, held our hearings and came up with a dry hole.

When the Natural Gas Act was passed by Congress in 1936, it provided that the regulation imposed thereby would not relate to the production of natural gas for sale in interstate commerce. In 1954, in a five-to-four decision, the Supreme Court ruled otherwise, and since that time an effort has been made by the Federal Power Commission to regulate the wellhead price of natural gas. In spite of the continuing efforts of that Commission to regulate this wellhead price, the experiment has not been successful, and we have certainly had adequate time in nineteen years to see if such regulation would work.



When announcing my co-sponsorship in the 92nd Congress of S. 2467, the so-called sanctity of contract legislation, I questioned the logic of regulating and restricting the gas industry to a greater degree than we have other segments of the energy family. It did not seem reasonable to me then, nor does it seem reasonable to me now, to restrict natural gas from seeking its price in the marketplace in the same manner in which we permit oil or coal to seek their price levels.

Federal regulation of natural gas has resulted in maintaining the price of natural gas at an artificially low level. While the prices of other and less desirable fuels have increased with the price of other commodities, the price of gas has remained low: And, as a result, the demand skyrocketed and it has been used in the past and is being used today for many purposes that could have been satisfied with coal and other fuels. Likewise, the low price has discouraged the exploration for and development of new reserves since the cost of searching for such gas, particularly in offshore areas, has skyrocketed over the past many years.

History may well record that our own greatest contribution to our own energy crisis may have been our creation of this artificial price for natural gas.

If we can believe even our most pessimistic natural resource surveys, well hidden under the surface of our continent as well as our Outer Continental Shelf are significant volumes of potential energy. If this is true, and I believe sincerely that it is true, then it's fair to ask why we don't explore for and produce this valuable natural resource. If I could answer this question with one word that word would be incentive.

The growth and power of this Nation's economy is founded in free enterprise. My son Webb mows a neighbor's lawn because he gets a couple of bucks for it. He's spurred on to find another lawn by the promise of additional dollars. I don't think this enthusiasm would continue if he were prevented from charging his customers enough to make the mowing worth his while. Webb's situation is not unlike the one in which the natural gas industry finds itself today. I believe that we must increase the incentive to explore for and produce more gas.

Others argue that incentive is not the real answer. One thing for certain the issue is highly emotional. Nobody is neutral. Everyone has strong views.

There are those who seem to think the shortage is caused by the oil industry. Others place the whole blame on the Federal Power Commission. The truth probably lies somewhere in between.

I also have some firm views. I know, for example, that before the Federal Power Commission began regulating wellhead prices, drilling activity was on the upswing, the industry was finding more gas than the Nation was consuming, and there were adequate supplies for anyone fortunate enough to be close to an interstate pipeline.

Since the Federal Power Commission began setting wellhead prices, drilling has been depressed, we have consumed more gas than we have found and many consumers—including some in my own State—are having their natural gas service cut back.

One point on which most seem to agree is that the natural gas shortage is very genuine, but it is probably more severe than most Americans realize. I am also convinced that many of our other fuel problems—including shortages of propane and heating oil—are directly related to the shortages of natural gas. When people have their natural gas service restricted—which is becoming increasingly prevalent—they turn to propane and then to heating oil, thus causing a domino effect right down the line.

We must come to grips with the natural gas problem. We face the spectre of increasing dependence on foreign supplies and gloomy prospects of fuel shortages at home. We see plans for foreign gas coming into the United States at \$1.25/Mcf and more. Yet we seem to be unable to decide whether the well-head rate for natural gas produced right here in our own country should be \$.24 or \$26/Mcf.

The shame is that even as the nation is threatened to go cold—and I don't think that statement is a bit too strong—people are still trying to find someone to blame.

Regardless of who else must share the blame, much of it belongs right here in Congress. We have too long condoned a regulatory process which just does not work. It must be measured by the record it has made. That record indicates the consumer and the country have not been served adequately.

We must take decisive action to remedy the situation. The dosage must be strong, it must be the right kind, and it must be given quickly. In the case of our total energy problem we are at one minute before midnight.

Mr. Chairman, my operating philosophy is quite simple. When something doesn't work, you don't expand it or extend it. You change it. I think this is what we must do in the case of well-head prices.

That we must increase the well head price of natural gas is to me academic. By how much—and by what means remains a question.

Certainly there should be no argument concerning new gas. It is argued that so called old gas may not be entitled to these increases. I can understand this argument as exploration and production costs have already been provided for. However, it would seem to me that we must arrive at some solution which would permit an increase in old gas to provide the funds required to finance new exploration and new production. This seems to be the most logical way to generate sufficient cash flow to permit producer to provide the gas we need.

There are those who would characterize such action as being anti-consumer. As the ranking minority member of the consumer subcommittee of this committee, I have a particular responsibility to the consumer and I believe that price incentives would be in the consumer's interest. As we deny the consumer the product he needs we reduce his standard of living. As we curtail his industrial expansion we create economic loss. To me the reduction in living standards and the economic loss resultant from such curtailment is anti-consumer.

But it is important to weigh very carefully the impact that these increases will have on the consumer.

In August of this year the foster associates released a study concluding that if the field price of all natural gas *not* under contract immediately rose to 55 cents per thousand cubic feet, the average householder would pay only \$8.30 more per year for his supply starting next January 1. This would be an increase of only 5.3 percent on an average yearly bill of \$155.73. By 1980, the price increase would amount to \$33.06 annually. (The average price of natural gas now sold in interstate commerce is about 21 cents per thousand cubic feet.)

The study shows that price increases to the householder would be gradual and minor for two reasons:

—Most of the gas now being sold is under fixed price contracts, generally for periods of twenty years.

—Only seventeen percent of the consumer's bill consists of the field price of natural gas. The rest goes to pipe line companies and local distributors.

The study also lists the increases the consumer might expect if the field price went to other assumed levels, either higher or lower than 55 cents per thousand cubic feet.

I am concerned, Mr. Chairman, as you apparently are, as to what happens if well-head prices are deregulated in a time of shortage. I am also concerned that the increased revenues resulting from deregulation are directed back into domestic exploration and development. I plan to study these issues very carefully over the next several days.

But I am primarily concerned that we solve the natural gas shortage. And I think this can best be done by relying more heavily on the forces of the private market system, than by relying on the forces of the regulatory process.

These hearings are extremely important, and I hope as a result of them we can move forward with legislation to solve the gas shortage.

Senator DOLE. I have been asked by the subcommittee chairman, Senator Gravel, if it is satisfactory to Mr. Miller that he be preceded by Mr. Tomlinson. Senator Gravel wants to be back to question Mr. Miller, plus Mr. Tomlinson is a Kansan and I am a Kansan. There is no one else here to call the witness.

So we are pleased at this time to have the statement of Warren Tomlinson, president of the Kansas Independent Oil & Gas Association, from Wichita. I would say at the outset, Warren, that I have read your statement, and I know you have been listening to some of the other hearings this morning. In addition to your comments on the specific legislation, S. 2806 it might be a good time to discuss anything else that would be helpful to the full Finance Committee or this subcommittee, because, as I think, as you already know, in Washington or in Congress everyone is going to be having energy hearings. It is a good time to make a record.

You know our industry in Kansas. You know what it means to our economy, so you are not confined to your statement, if you want to digress.

**STATEMENT OF WARREN E. TOMLINSON, PRESIDENT, KANSAS INDEPENDENT OIL & GAS ASSOCIATION, WICHITA, KANS.**

MR. TOMLINSON. Mr. Chairman, my name is Warren E. Tomlinson, of Wichita, Kans. I am president of Tomlinson Oil Co., with headquarters in Wichita. I am here representing the Kansas Independent Oil & Gas Association, a 1,400 member association of independent oil and gas producers and related interested persons, founded in 1938.

I have been an independent oil producer for 23 years. My company, Tomlinson Oil Co., was founded in 1957, and currently has 40 employees, with active exploration and production operations in Kansas, Oklahoma, Texas, and Louisiana.

I would like to stress the word independent producer as contrasted with major companies and major producers. The independent producers are the backbone of the oil and gas industry in Kansas. We are small businessmen drilling 85 percent of the oil and gas wells in our State. The crude oil purchasers in Kansas buy the oil we find and produce and send it to their refineries for processing into the many petroleum products. The point is that the independent producer has only one opportunity to recover his investment and make a profit and that is when he sells his crude to the purchaser. The purchasers, mostly major companies, are vital to the petroleum industry but, just as important, is the need to preserve the role of the independent producers in exploration and producing more oil and gas at this critical time in the history of our country.

Oil and gas production in Kansas has been declining for the last 15 years. As the crude oil price remained static over the years, the price of oil field tubular goods and cost of labor continued to rise dramatically. Today, Kansas refineries have had to look to other sources for crude oil. Now, much of the crude refined in Kansas is imported from Canada. These factors have led to a dramatic reduction in the number of independent operators in Kansas as well as the rest of the Nation.

To emphasize the need for incentives to stimulate the oil and gas industry in Kansas, the Kansas Legislative Senate Committee on Conservation and Natural Resources, has introduced legislation to increase the allowances for depletion for working interests in oil and gas production from 22 percent to 30 percent and with the limitations on net income increased to 75 percent of taxable income. We would endorse similar tax reform at the Federal level.

Our industry in Kansas has also proposed State legislation that would provide a tax credit or incentive for new production, by not taxing oil and gas leases the 1st year of production.

We believe that if the independents were left unhindered for a period of time, perhaps for 2 years, with a reasonable price for crude oil and natural gas, and with other suitable incentives, that a substantial improvement in the supply of domestic crude oil and natural gas will be achieved.

We have reviewed S. 2806, the Energy Revenue and Development Act of 1973. We believe it is a fine attempt to come to grips with an

enormous challenge to our country. There are statements in the bill that are encouraging, such as:

The private market must be allowed to operate freely in order to attract capital for the development of our indigenous energy resources.

Also we concur with creation of tax incentives to encourage domestic production and with the culmination of price controls.

We have selected key topics contained in S. 2806 on which to make specific comments we think will be helpful in developing this legislation.

#### THE ENERGY TRUST FUND

The establishment of a tax based on the British thermal unit content of oil and gas should be carefully considered as to its effect on future production and conceivably it could be counter-productive in that it would tend to discourage marginal producers and cause many wells to be abandoned prematurely. There are situations where operators of old gas wells are compelled to sell gas at such a low wellhead price that the proposed tax on British thermal unit content would result in an extremely high tax of approximately 50 percent on the gross wellhead selling price of such gas. Under many old life-of-lease gas contracts there are no new tax passon provisions; and, likewise, no provision for renegotiation of the wellhead gas price.

The result would be abandonment of such wells rather than operation at a loss. Unless crude oil is priced on a British thermal unit basis, a tax based on British thermal unit would be inequitable. Lower gravity oil has a higher British thermal unit but it brings a lower price. This gravity price penalty was included in the petroleum allocation regulations recently published by the Federal Energy Administration.

#### THE FEDERAL ENERGY ADMINISTRATION

We understand the need for this feature of the bill, but we want to urge the stimulation of existing and experienced private enterprise rather than reliance on a massive Federal bureaucracy. We applaud the desire to establish price and tax incentives, which the industry has not had in the past. We understand the need for extensive research and development activities to develop new alternative energy sources, when the economic feasibility of such new resources are identified.

#### THE COMMISSION OF ENERGY TECHNOLOGY ASSESSMENT

In our opinion there is a role for government to provide reliable resource material and direction to the industry by skilled and knowledgeable persons. We believe a working partnership between the oil and gas industry and government, who must reflect the welfare of the consuming public, can and should be established.

#### END OF PRICE CONTROLS AND DEREGULATION OF NATURAL GAS

We endorse the phasing out of price controls on crude oil. This will increase economic incentives for oil exploration and production and

stimulate the initiation of secondary and tertiary recovery projects. We also endorse the proposal to deregulate natural gas. Higher wellhead gas prices are needed to stimulate exploration for domestic gas.

#### EXCESS PROFITS

We have heard a lot about so-called "windfall profits" and we are concerned that the petroleum industry has been singled out for undue criticism in this regard. Perhaps we are naive, but we always thought the Internal Revenue Service tax regulations are designed to intercept excessive profits. In the past, the independent producers have been able to show only minimal profits, and the unfortunate result has been reduced domestic exploration. Is it wise now that profits show the first promise in many years of attracting sufficient exploratory investment capital, to impose a tax which will deter that investment? Naturally, we do not believe any industry should reap unconscionable profits to the detriment of the consuming public. Here again, we believe the independent producer should be distinguished from those in the petroleum industry who may have the opportunity to make a multiplicity of profits from the oil purchased from the independent producer.

The profit picture affecting the independent producer is directly related to his risk of exploring for new resources; the cost of completing a producing well; the repayment of his bank loans and risk capital. Our profit is directly related to the price of oil and gas sold, and it has only been in the last 60 to 90 days that we independent producers have been sufficiently encouraged with a price that warrants increasing exploration activities and the development of marginal and older fields.

We agree with a concept for the reinvestment of a portion of profits into additional and new development. Depletion of our reserves by production requires continued reinvestment. It frightens us to think that some suggested procedures might withhold cash flow so essential for financing continuing operations.

#### INVESTMENT TAX CREDITS

The 14 percent investment tax credit for exploration drilling is needed in our industry and we support your proposal. We urge you to include development drilling in your definitions and broaden your definitions of what is meant for exploratory drilling so that it will be flexible enough to apply to the varying conditions throughout the United States. S. 2806 is very restrictive in definition as it relates to what is customarily followed in Kansas. The definition of a wildcat or exploratory well should be left to the State regulatory agency regulating oil and gas activities.

#### RESIDENTIAL CONSERVATION

We applaud your attempt to encourage conservation. As a representative of independent producers, we think this is in the national interest to do everything possible to conserve and prevent waste of energy wherever it can be identified.

## FEDERAL LAND PRODUCTION

We are in favor of increasing production from Federal lands, providing that it is done with sound engineering judgment and practices and not in a way that might damage the reservoirs involved.

Mr. Chairman, in closing, I would like to say that I am grateful to have the opportunity to appear before your committee. We know Kansas is well represented on your committee with Senator Dole, and he knows, and we want you to know, we are available to assist you in any way possible in developing this legislation.

That is the end of my testimony. I would like to make one or two points here. I listened to Senator Mondale today discuss prices, and he obviously feels that we are getting plenty of money for our product. You have to remember that the expertise involved in finding new oil has to be financed by small producers with our "old" oil. That "old" oil has to pay for the increased costs of exploration.

Kansas peaked out in 1956. In 1956 we produced 124,467,000 barrels of oil. In 1973, we produced 73,743,000 barrels of oil, primarily because we have had no increase in the price of our product.

I have to agree that some of the prices have gotten completely out of control. I certainly do not think that the \$5.25 a barrel that we are receiving now for old oil is excessive. I think that also, when you do consider the Btu tax concept here, you will recognize that the prices paid for the product are not excessive with reference to the amount of Btu found in a gallon. I think you have been furnished that information.

Senator DOLE. With the reference to price, I think if you just consider the price increase by itself then there might be some room for at least skepticism. But, if you add to that the increased costs that you pay, I assume for everything, nearly everything, and the fact that you cannot even obtain tubular goods in some areas—

Mr. TOMLINSON. Tubular goods, for example there are no new tubular goods in Kansas. The 5½ inch casing which is the normal pipe we use in casing, has been selling from \$1.50 to \$1.90 a foot. The cheapest I have seen it purchased for in the last 2 months, is \$5.50 a foot. It is completely out of line. You cannot afford to complete a marginal well, even at today's prices, when you pay that kind of price for your casing.

The prices of drilling have gone up. A year ago, a fair price for rotary rigging in Kansas was \$3 a foot. Now it is \$3.75 to \$5 a foot. I am talking about the easy drilling, not the more difficult drilling in central Kansas, but where the greater portion of Kansas oil has been produced, where most of the wells have been drilled over the past 20 years.

Senator DOLE. I should know, but how many rigs do we have operating now?

Mr. TOMLINSON. We have 41 rigs operating in Kansas at the present time.

Senator DOLE. That is an increase?

Mr. TOMLINSON. We are up about 5 rigs. We do have more rigs in Kansas than the 41. The only reason we are not drilling more is because there is no casing.

I think there have been two good efforts made, Misco, a supply company supplying the midcontinent area, has come up with a wildcat

pooling situation where they will furnish extra quota of pipe to the independents that are drilling wildcats. We never start drilling a well thinking we are going to have a dry well although most of them are. But if we wanted to drill this wildcat well and did not have the string of pipe, we would not start.

If we know there is a stockpile of pipe over there, then we can drill that well, and if we do get a commercial producer, then we can call on it.

The same thing has been done on a larger scale by Lone Star in Texas, they have made pipe available through all the suppliers in the country. Their proposal is that they intend to furnish a string of pipe a day, 365 days, which would assure a local supply for the independents. This really goes to the independents and to the people without history with the supply company or steel company. They are new in the business. I think it will encourage younger people and new people in the oil business to maybe get actively involved in exploration for new oil and gas reserves.

Senator DOLE. Do you see any danger in the price of oil from the stripper wells and the new oil under the Cost of Living Council's two-tier system getting too high, so somebody may be looking at that as an example of an artificially high price? Has it reached that point yet, do you believe?

Mr. TOMLINSON. I do not think it has. I do not see how it could happen in Kansas. The average production in Kansas is five barrels per well a day. It would be hard to think that you could show up with windfall profits if you were getting \$10 to \$12 a barrel for the oil.

In my own company, when the price of stripper oil reached \$7.50 a barrel, according to our engineers, it extended the life of our production 6½ years. This is oil that we normally would have left in the ground. It does not make any difference to the refiner how much it costs to produce that oil as long as he can keep his refinery capacity running at 100-percent capacity.

What we do is, we lengthen the life of all the wells in Kansas, and produce more Kansas crude for refiner's use over a long period of time.

Senator DOLE. I think that is one of the difficulties with the so-called excess profit provision that was in section 110 of the energy bill discussed this morning. I think the general public has a feeling that it applies to "the big companies" whoever they may be—I could not name them. As Mr. Simon has said today, and as one of the former Chiefs of the Internal Revenue Service said yesterday, the excess profits provision, as drafted by the House Commerce Committee which now appears to be hanging up the entire energy bill, covers anyone who touches the product from the wellhead to your gas tank, wherever it might be.

If the service station operator, for example, has a greater profit this year than he had in the base year from 1967-71, and he would be subject to the excess profits tax as well as some "major" company.

In addition, the profit margin of independents, is less than that of major oil-producing companies as I understand it?

Mr. TOMLINSON. Very much so. I think you can probably count on one hand all the independent producers in the State of Kansas that are making profits, any profits, really during that base period 1967-71. That was really a period of recession and depression as far as the independent oil operator was concerned in Kansas.

Senator DOLE. Your profit margin is less. I am not suggesting what the profit margin of the "majors" may be. There have been different figures cited by different people.

Mr. TOMLINSON. As I said before, we only have one level that we make a profit on. I think we have been held at a ridiculously low well-head price because oil has been cheap in the past. You did not see any of these price increases show up until foreign crude became more expensive than domestic crude.

Really, we have a long way to go just to pay back the money that we owe our reservoirs. I have not seen an oil man, an active oil man of my acquaintance anyway, that does not spend probably three times what he makes, reinvesting in the ground. The minute you start producing a barrel of oil, you are starting to go out of business on that lease. You have to find other reserves to replace them.

Senator DOLE. Do you share the view that we ought to have—and I think Mr. Simon indicated this morning—the option of either paying the windfall profit tax or using the plowback provision?

Others say that if you make a profit, you should not need any added incentive as far as any plowback of earnings are concerned.

Mr. TOMLINSON. I think you have to have all these incentives, particularly for the independents. I have to keep going back to the independents because they are the ones who are doing most of the wild-cattin in the United States. Because this is such a risky business, we have to look for outside capital. So we have to have some incentives.

The very best incentive we can have is a good price for our product which is really what we have been looking for. You also have to think that when you build a warehouse, or a manufacturing plant that is there as long as you can keep it going, you can depreciate that. But, in an oilfield, the minute you find that oilfield, and you start making your sales, you start going out of business.

If you intend to stay in the oil business, you will be reinvesting those profits in exploration. I would say maybe the only profits you will get out of this might be your depletion. All the rest of the money would be reinvested in exploration. I say that "might" be. You will notice we have referred to increasing depletion, or keeping depletion, with the working interest part, not particularly the royalty interest part. They have no investment, no continuing investment, they are losing one of their resources from the land they own, but they have not had to take the risk, they have not had the cost of producing a product either.

Senator DOLE. We also had an expert testify yesterday that at the same time when you have the prices going up you are still providing more incentives. He suggested that we consider doing away with the intangible drilling expense provision, and that we at least consider repealing the depletion allowance. Then taking a hard look at foreign tax credit.

That is not a view shared by some of us; at least he raised the question, that was the purpose. I am not in the oil business, but there are a lot of people dependent on the oil business for their livelihood in the State of Kansas and in many other States. It has been a sick industry—I think you said in the last 15 years it has gone down more than 100 percent?

It appears that the best way we can keep it on the ailing list is to take away the incentives then to let it just trail off into nothing in



another decade. It is certainly something that affects—as I keep trying to underline, or underscore—more than the major oil companies.

I have a feeling that most Americans, and most Kansans are not looking at the independents, and are not aware of the fact that section 110 of the bill applies to every aspect of the petroleum industry, including the service station operator. Somewhere along the line, we are going to have to make this distinction and hopefully the American people will understand that we do not want to kill the industry in an effort to correct some of the abuses.

Mr. TOMLINSON. Senator, we have had all of these incentives. We have had the intangible drilling costs; we have had depletion. Despite all of those, there are only 25 percent of the independents still around that were here 15 years ago. So I do not see how you can create any incentives or try to find more oil if you start taking these things away from them the very minute everybody starts getting exploration-minded again.

If this is such a great business, how come there are not more people in the oil business?

Senator DOLE. I think those on the outside view it as a rich man's game, with everyone in it of course having a great deal of money. They do not recognize that there are a great deal of risks. Of course some people have made money in the oil business.

Mr. TOMLINSON. That is right. You only hear about the winners. You never hear about the losers. The winners stay around. The losers go out and find another job and do something else.

Senator DOLE. You refer in your statement to the difficulty you might have with the statutory definition of "wildcat" or "exploratory drilling." I think you indicated that it best be left to State regulatory agencies.

Although this is not my bill, this might be an area that it might be helpful if you clarified that.

Mr. TOMLINSON. I would like to. I think every geological area has its own problems. Not necessarily caused by boundaries or States, but you have geological provinces and you have reservoirs that can be drained on 80-acre spacing and reservoirs that can be drained on 40-acre spacing; some reservoirs have to be drained on 10-acre spacing. There are many sizable reservoirs and I speak primarily of Kansas because that is where my experience is, that do not cover 640 acres that have produced millions of barrels of oil, and because of a dry hole or two, or a fault, the topography at the time of deposition or what have you, have caused a barrier there.

It might be that only half a mile away there is another oilfield, but it is not indicated by the one that you have producing. I do not think that you can just arbitrarily say that a well has to be 2 miles from production before it constitutes a wildcat. Certainly in Kansas, it cannot be a vertical difference of 3,000 feet. There are places in Kansas that we reach the basement at 3,000 feet. Most of our producing areas where most of our production has been to date is on the central Kansas uplift. If you had to go 3,000 feet below where we are, you would be 2,500 feet into granite and nobody can get there.

That is why I think that possibly not the State regulatory body, since you have to recognize the geological province that you are in,

the type of reservoir that you are draining, and what your different traps are before you can really define a wildcat well.

Sometimes a wildcat is 40 acres away, sometimes it is 2 or 3 miles away. Both of these oilfields could be wildcat oilfields.

Senator DOLE. There has also been some discussion—again, this does not have direct reference to the bill but I think that it does cover the problem before the American people—about how do we find more oil? There is a great deal of it, of course, in the ground now, and through secondary or tertiary recovery methods, it might be extracted. In some cases, the holes that we know that the oil is there, there have been all sorts of estimates about how much may be there across the country and in our State of Kansas.

As you see it what would be the best approach either from a tax standpoint or an incentive standpoint, to encourage secondary and tertiary recovery?

Mr. TOMLINSON. Price is the No. 1 incentive. Whenever you get into secondary recovery, you are spending practically all capital dollars, there is not any tax incentive in secondary recovery or tertiary recovery.

If you had investment credit tax, then you would have an incentive to go into secondary recovery. I think that probably would be the main thing. As I understand it when you drill an input well in a secondary recovery project, that is all capital investment. If you are drilling an oil well you would be able to write off your intangibles. These intangible costs are one-time occurrences.

On an input well, or a disposal well, those are all capital investments. If they could be treated like a regular development well, that would be one way to help. But, I think a fair price for the product—and you have to recognize when you start recovering oil by secondary methods—that it becomes much more expensive to lift that oil. As you start removing the water you have injected in there along with your oil, then your lifting cost becomes greater and greater as you start to flood out your reservoir.

So you reach the economic limit much quicker than you do on a well that is produced under primary reservoir pressures. Tertiary is something that we have not really done a whole lot with, yet. There is a lot of research to be done with it. There has been a lot done on it and the major companies have done a lot. The service companies have worked on this considerably, Dow Chemical for example, as well as other major service companies have all gotten involved.

We have, I think, millions of barrels left in Kansas that are low-gravity oils in low-permeability sands. They will not waterflood. They have not reacted too well to our fire flood. There is enough oil there that I think eventually with enough dollars, someone will figure out how to get it out.

Senator DOLE. Do you think it is worthwhile pursuing?

Mr. TOMLINSON. Definitely. I think Dr. Preston and his group are really working on it.

Senator DOLE. As I understand it, the position of—I cannot say all independents, but I can say, generally—your association would be in opposition to section 110, the so-called excess profits renegotiation mechanism?

Mr. TOMLINSON. Very definitely. I think all the independent associations take the same view.

Senator DOLE. I do not know how—I think that Chairman Long has expressed the difficulties of trying to write some provision—to correct, call it abuse, or whatever, an unconscionable profit, without doing some damage to those who are just normally engaged and pay taxes based on that profit they make.

Mr. TOMLINSON. That is right. But you have to recognize the fact that the oil business is still a very risky business. If you are allowed to take the revenues you get from your wells, as I say, practically every independent will reinvest that money in looking for new reserves. There are not going to be any, I think, unconscionable profits from that. It might be that he goes and spends his money, but he is spending it looking for more reserves. He may not find as many as he thought.

Believe me, all the easy oilfields have been found. The ones we are looking for now, they are probably bigger, but old Mother Nature has hidden them much more carefully than she did with the first ones that she let us have. They are around. They are going to be below 10,000 feet, which most of the independents have not been able to finance. It has been above their economics.

Senator DOLE. I think, in addition, if we are going to look at it from the standpoint of one industry, I do not either defend or otherwise comment on it. There are other prices that have skyrocketed in other industries, in the products that they produce. So if we are looking at a windfall profits tax, maybe we ought to make it broad enough to cover not just the one industry. I think some that do not produce oil and gas in their States might produce some of the other things. We might end up with a more reasonable provision that would be responsible.

If you do not have an oil and gas industry in your State, and you do not have 20,000 or 30,000 people employed in that industry, and you are not going to be affected by it at all, as some are not and some on this committee are not, it is quite easy to raise the hammer. And I do not suggest in some cases that it should probably be raised. If we broaden the base of the tax to include other products of some other industries from some other area, maybe we can do justice and still not kill off the industry.

Mr. TOMLINSON. I agree 100 percent. This is the very first time, and I have yet to see any of those checks come through with the windfall profits.

Senator DOLE. It does not say windfall profits check on it or anything?

Mr. TOMLINSON. No, it does not. None of it indicates enough to pay off my bank loans yet. But having been involved over 20 years in raising risk capital and we have had to go every 4 or 5 years to raise funds. There is a different facet of industry that is making money, so that is where the oil man goes to get somebody with some tax dollars to risk in looking for oil and gas reserves. That is a natural thing.

It all goes back to the same thing that we have harped on time and time again. We are all spoiled, we really are, in the cheap energy that we have become accustomed to. The fact that natural gas has been so cheap for so long that we bypass so many of the other fuels that we should have been using while we were exhausting these natural gases.

You asked about propanes today. The primary source of propanes is from wet natural gases. If we were producing more natural gas we would be producing more propane. When we cut off the use of natural gas to certain areas, the number one substitute is propane. Then it causes an immediate shortage of propane. You can only get it two places, either out of the refinery or out of a gasoline plant that is taking propanes out of natural gas.

Senator DOLE. As an aside, in some communities you could buy Skellgas for 79 cents and the other across the street, the same propane, was 38 cents. I had a lot of public meetings; the 79-cent people never came to my meetings, and a lot of the others did not.

Mr. TOMLINSON. I am sure they did not.

Senator DOLE. It is almost impossible to resolve it. I am not sure Mr. Simon can. But I think under the regulations they are adding on the cost of other byproducts to the propane, so hopefully that can be changed.

I appreciate your testimony, Mr. Tomlinson. I am sorry Senator Gravel was called away, but he is returning. If there is anything else you would like to add to the record, we would be happy to have it.

Otherwise, I think I will proceed to Mr. Miller, and he can proceed with his statement. By the time he finishes, maybe Senator Gravel will be here.

Mr. TOMLINSON. I thank you again, Senator, for giving us a chance to testify.

Senator DOLE. Thank you.

#### **STATEMENT OF C. JOHN MILLER, PRESIDENT, INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA**

Mr. MILLER. Thank you, Senator.

This has been a unique experience for me. I have been singled out by being an oil man; I have been singled out by being an independent oil man. I have never been singled out for not being a Kansan, and I enjoy the distinction.

Senator DOLE. I was not trying to single anybody out, because under the new registration laws it would not take you long to become a Kansan. So I did not mean it critically. I know Senator Gravel wanted to be here because you had some comments on his bill.

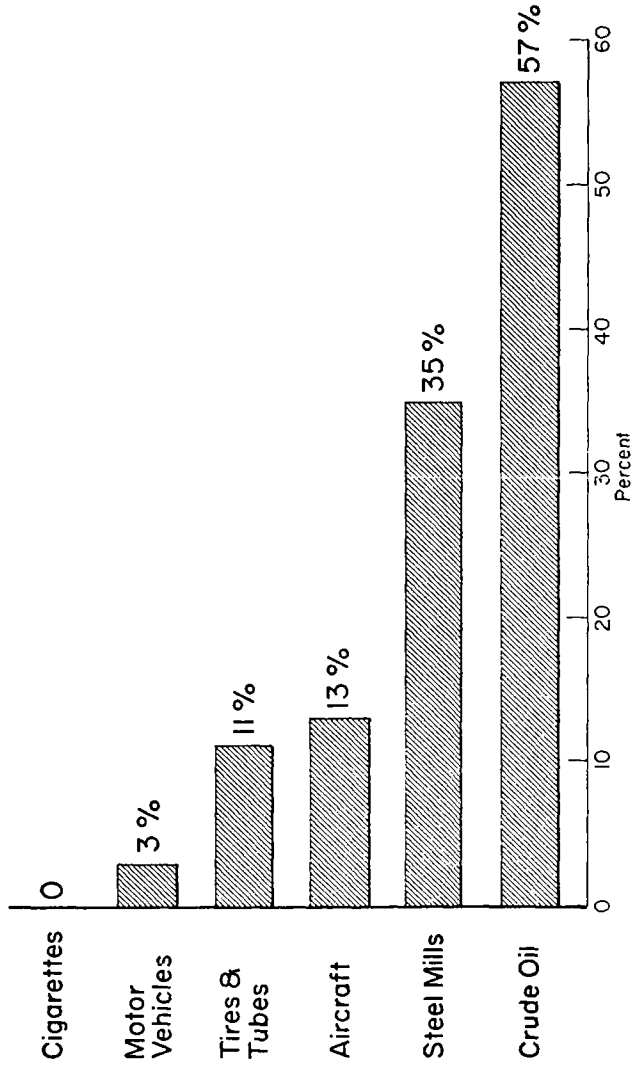
Mr. MILLER. I know you did not, and I appreciate, of course, being a good friend of Warren's also I have no problem at all with it.

I am pleased to be here. I appreciate greatly the opportunity to appear before you and to give the views of the Independent Petroleum Association of America.

This picture, appeared in last night's paper, and identified the eight major oil companies has caused me some great concern because, from the reporting that has been going on over the last few weeks, I am afraid that perhaps the general public has been led to the belief that there are no other oil companies other than those being identified and, in some cases, attacked because of proposed or supposed profit pictures.

I would like to point out that in the statement that I will be giving, at the back of it, there is a chart which I think calls attention to something that should be vitally important to this committee and to every U.S. citizen. That is, if you exclude the eight largest crude oil producers, 57 percent of the industry is made up by other people, so-called small and medium sized companies.

**PERCENT OF U.S. PRODUCTION  
BY MEDIUM & SMALL COMPANIES  
IN 1971 (excludes 8 largest producers )**



Sources: U.S. Dept of Commerce and IPAA

If you exclude the eight largest producers in other industries, such as steel mills and aircraft and tubes and tires and motor vehicles, et cetera, you see a tremendously diminishing picture. So I think it is very important that we recognize that the oil and gas industry is not alone made up of the so-called eight large companies.

Senator DOLE. I think that is important. I have been trying to suggest that in the hearings, not these, but the full committee hearings, as there is that feeling. I do not know where the separation point is between major and minor, whether we are talking about oil companies, big or small farmers, big or small businessmen. I know there are some arbitrary definitions from time to time.

I think it was last week on CBS I learned about an oil company that I had not heard of, I think Murphy Oil Co., that ranks 20th or 27th. They are drilling around the world, and they have, I think, an interest in Saudi Arabia. They are doing offshore drilling. I do not look upon them as an independent the way I view an independent coming from Kansas. Neither are they one of the eight major producers. I just do not know where the dividing line is.

It seems to me, as I have said to Mr. Tomlinson and others, the oil industry is in for a rough year—when we say “industry,” we include everyone—unless it can be seen in a proper perspective and unless we can come up with something that takes care of any abuses or unconscionable profits and still preserve the industry.

Mr. MILLER. Interestingly enough, Senator, the definition of the eight large companies is derived from the U.S. Department of Commerce definition and, also, I think in some instances the Justice Department uses this for some of their definitive work. However, if we were to drop down and take off the 30 largest producers, we would still find that the oil and gas industry is represented to the extent of 35 percent by those remaining.

If you did the same, take off the 30 largest producers or owners of the other industries that we have cited, there would be no one. So, again, I think it points out very graphically that the oil and gas industry is made up of a multitude of competitive forces, and I think this falls in with some of the hearings on monopoly that we have had here recently also.

Senator DOLE. Before you start, let me say this. Of course, you can read the statement; or you can summarize and it will be made a part of the record as though given in full. In either event, we have a rollcall vote in progress. I need to run over and vote and come right back. I should be back in 5 or 6 minutes. Or we can go ahead and proceed until the next bell rings, whatever you would care to do.

Mr. MILLER. Whatever is your pleasure.

Senator DOLE. We will then recess.

[A brief recess was taken.]

Senator GRAVEL (presiding). The committee will come to order.

Those present may be interested to know that through a very fine ceremony signing the Alaskan pipeline permit have gone and have received a check and everything is in order.

I am very happy to see you, Mr. Miller. I asked Senator Dole to alter the sequence as I did not want to miss the opportunity to hear your testimony. Would you please proceed at your own speed on the subject matter. I look forward to your remarks.

Mr. MILLER. My name is C. John Miller, I am a partner in Miller Bros. at Allegan, Mich., an independent oil and natural gas exploration and producing organization. I appear here as president of the Independent Petroleum Association of America, a national organization of domestic independent oil and gas producers and explorers with some 4,000 members in every producing area of the United States.

We welcome and appreciate the opportunity to express the viewpoint of the independent segment of the domestic petroleum producing industry. Our comments will be addressed to those aspects of the "Energy Revenue and Development Act of 1973, S. 2806" which would particularly affect the operations of independent producers and vitally affect exploration for and development of conventional petroleum, oil and natural gas, fuels indigenous to the United States.

At the outset, I would like to briefly discuss the vital role of the Nation's independent explorers for, and producers of, oil and natural gas. Traditionally thousands of independents in the industry have accounted for 75 to 80 percent of the exploratory or "wildcat" drilling directed at finding new reserves of these fuels. It should be recognized that our country achieved a position of energy sufficiency because, on balance, Federal and State laws and policies served to encourage thousands of independents to participate in petroleum exploration and development.

The United States became the largest oil and gas producing and consuming country primarily because of this multiplicity of effort by thousands of independent explorers.

The evidence now is persuasive that Government's policies since the mid-1950's, directed at holding oil and gas prices unrealistically low, have been the primary influence in discouraging exploration and development, bringing on worsening shortages of natural gas and unnecessary dependence on remote and vulnerable foreign oil supplies.

Government economic policies such as Federal price regulation of natural gas and direct and indirect oil price controls, had several predictable results. They caused a prolonged flight of capital from domestic exploration. The ranks of active independent explorers and producers were thinned by about half, dropping from approximately 20,000 in the mid-1950's to about 10,000 who remain in the industry today. The result has been an unnecessary shrinking of our producible petroleum reserves.

Just as the declining activity by independents, who traditionally have performed the lion's share of domestic exploration, has been a major factor contributing to our worsening energy supply position, we believe efforts to revitalize and encourage the independent sector offers the most effective and least costly means to achieve the basic intent of S. 2806—regaining energy independence for the United States.

As recognized by this legislation, this country has the resource base, the technology and know-how, and the will to solve its energy problems. The lacking ingredient has been progressively eroding economic incentives. From its abundant remaining but undeveloped sedimentary basins, the United States has the potential to develop significant new conventional oil and natural gas resources. These petroleum fuels can be developed far quicker and at a much lower cost than any alternative energy resource. For the short term of the

next 10 years or so, our reliance for energy will continue to be primarily filled by oil and gas. During this near term period, therefore, we have no greater potential for meeting our energy needs than by providing the public policies and incentives to assure maximum efforts to explore for and develop the oil and gas deposits in the lower 48 States.

Again, I emphasize that if we are to maximize development under such policies, the independent now active, and potentially active, will and must play a major role, as they always have. In this connection, the traditional role of independents has been a tremendous competitive influence in the domestic petroleum industry. This is illustrated by your attached chart, "Percent of U.S. production by medium and small companies, 1971," which shows that medium and small companies in domestic crude oil production control a far greater percent of production than do their counterparts on other basic industries.\*

Senator Gravel, we observed this chart, discussed its meaning, while you were absent. The point that we were particularly interested in making is that the oil and gas industry is not made up of just the eight largest companies but that 57 percent of the production is controlled by other than those companies. And the comparison to other industries is well-illustrated on the chart.

Senator GRAVEL. That is an excellent chart. I am glad that you made that comparison.

Mr. MILLER. Thank you.

Many of the basic policies in S. 2806, including removal of price controls and new tax incentives for domestic development, would go far toward reactivating the thousands of independents and in accelerating exploration and development in the lower 48 States.

I would like now to summarize our position on some of the policy questions covered in S. 2806:

### I. DEREGULATION OF CRUDE OIL AND NATURAL GAS PRICES

Government has imposed price controls directly on natural gas at the wellhead since 1954. Since 1959 it has limited domestic crude oil prices indirectly through "jawboning" and has controlled these prices directly under economic stabilization programs in effect since August 1971. Government policies of holding wellhead prices of petroleum fuels unrealistically low since the mid-1950's have been a primary cause of present domestic shortages of petroleum fuels. Removal of these controls is essential, because their continuance would frustrate all other policy innovations to revitalize energy resource development.

### II. TAX INCENTIVES FOR DOMESTIC DEVELOPMENT

The concept of tax incentives to encourage domestic energy development is meritorious and commendable. Two specific proposals which we support are, one, enactment of tax credits covering expenditures for oil and gas exploration and development, as well as secondary and tertiary recovery projects; and, two, removal of the 50-percent limitation on percentage depletion, which primarily would help the marginal

\*See p. 1071.



small producer. The first of these is covered in S. 2806, and we would hope the committee would consider adding the second. Any new taxing mechanisms directed at producers, such as the Btu and excise tax provisions of S. 2806, would have the effect of discouraging new development and, therefore, should be weighed cautiously.

### III. LIMITING DEPENDENCE ON UNRELIABLE ENERGY SOURCES

The current embargo on Arab oil shipments, which has affected the economics of all major consuming nations, has demonstrated clearly the need for the United States to extricate itself from such dependency. In July 1971 our association recommended to the President the concept of establishing a "peril point" for limiting U.S. dependence on imported oil. This involved setting policy goals of achieving a level of oil import dependence which would be tolerable in the event of any substantial curtailment of imports. We believe, therefore, that the goal set forth in S. 2806 of progressively reducing U.S. dependence on foreign energy requirements to less than 5 percent of requirements is laudable and consistent with actions we have advocated as essential national policy.

### IV. GOVERNMENT'S ROLE IN RESEARCH AND DEVELOPMENT

S. 2806 would empower the Federal Energy Administration to acquire, own, and operate facilities to conduct energy research, demonstration, development, utilization, and conservation programs on an unprecedented scale. While the broad powers of the FEA are specified, no clear limits on its powers are set forth. The IPAA believes present circumstances warrant expanded energy research and development by Government, including broader programs to improve recovery of crude oil, but that commercial development should be left to private industry. Accordingly, we believe the legislation should be explicit in limiting the role of government.

Before discussing these policy areas in more detail, I would like to comment briefly on the scope of the challenge of restoring energy independence for the United States.

In 1974 total U.S. demand for liquid petroleum fuels will approximate 18 million barrels daily. Our production of all petroleum liquids will be about 10.6 million barrels a day. Our dependence on foreign oil, therefore, exceeds 7 million barrels daily, representing a doubling of imports since just 5 years ago; the previous doubling in our import volume took 13 years.

It is clear from these facts that the United States has a monumental job of "catching up" in development of its energy resources. The decline in reserves and availability has stemmed from 17 years of declining exploration for these fuels. We did not get into our energy supply dilemma overnight; we cannot get out of it overnight. Our capacity to produce crude oil has dropped for 6 consecutive years. We cannot overcome that much lag time in only 1 year or 2 years; even under ideal conditions.

While policy decisions hang in limbo, demand for energy continues unabated. Total demand for petroleum liquids is growing at about a million barrels daily per year. To the extent that natural gas demand

is unfilled, that energy requirement also is transferred to foreign oil, further accelerating our dependence upon others for essential fuel supplies.

Our deteriorating energy supply position has been recognized and in the talk stage in Congress since the first natural gas shortages emerged in the winter of 1968-69. In these 4 years, there have developed no meaningful improvements in the policies which contributed to our worsening energy supply gap. The only significant policy change was an adverse one, the 1969 reduction in the percentage depletion rate which increased the tax burden on the domestic industry by about \$650 million annually and, more important, reflected a willingness on the part of government to depend increasingly on imported oil.

Because we are beginning from a minus position, with a dependence on foreign supplies for about 40 percent of our liquid petroleum needs, the challenge of regaining energy independence is a monumental one, requiring massive capital expenditures and Government policy incentives that will serve to induce such expenditures. Recent investments in domestic oil and natural gas exploration have approximated \$5 billion annually. This level of expenditure ought to be doubled and increased each year.

Providing the political and economic climate that will encourage expenditures of these dimensions is the challenge that Congress hopefully will face up to in this session. Further delay will only assure that the Nation's current energy shortage will become an intolerable energy famine with far-reaching effects that could cripple our entire economy.

Now I would like to speak to the specific policy questions summarized earlier.

#### CRUDE OIL AND NATURAL GAS PRICE CONTROLS

In the mid-1950s, Government began to substitute its judgment for competitive market disciplines in determining the wellhead prices for oil and gas. Under a Supreme Court mandate in 1954, natural gas prices have been rigidly regulated by the Federal Power Commission since 1954. A condition of the oil import quota program initiated in 1959 required "surveillance" of domestic crude oil prices which resulted in effective price restraints by persuasion and coercion under successive administrations, both Democratic and Republican.

As a result of these Government-administered prices, the real price of domestic crude oil in constant dollars declined 77 cents a barrel or 18.5 percent in the period 1959-72, and the combined price of both oil and natural gas at the wellhead, with gas expressed in crude oil equivalent, declined 60 cents a barrel or 22 percent. Confronted with these persistently eroding real prices during a period of rapidly accelerating costs, independent oil and gas producers progressively curtailed their activities and thousands simply chose to sell out or quit.

Onshore exploration and development expenditures by independent producers dropped almost 50 percent since 1956, and the number of exploratory wells drilled reflected this decline, also decreasing about 50 percent. As a result, the Nation has a growing gap between its

demands for oil and natural gas and its capacity to produce these essential fuels.

Effective Government efforts to hold down domestic fuel prices were accompanied by demands for increased use of and dependency on low-cost foreign oil. Current events demonstrate the folly of this approach. Actions by Middle East and North African countries have resulted in the embargo on oil shipments to the United States. Prices for Middle East-North African oil have quadrupled in 1 year's time. Other exporting nations have followed suit, including Venezuela, Ecuador, Bolivia, Indonesia, and Nigeria, among others. Canada last fall instituted an oil export tax of 40 cents per barrel on oil shipments to the United States and progressively increased that export tax to \$6.40 per barrel, effective February 1, 1975.

The notion that we can somehow solve our energy problems while still maintaining Government-dictated price controls for natural gas and Federal Energy Office controls on the bulk of our domestic crude oil production is a false concept. It is the same concept that has led us into our present intolerable and worsening dependency on others for essential oil and gas supplies.

The unreality of such policies is illustrated by the fact that foreign supplies of both oil and natural gas are entering the marketplace, and the United States, at prices far above domestic prices. Liquefied natural gas, for example, delivers in the United States at prices four times the city gate prices of domestic gas approved by the Federal Power Commission. Imported crude oil is being delivered in this country at as high as \$12 or more a barrel, while the bulk of domestic crude oil production is controlled at an average of \$5.02 a barrel. Canadian crude oil at about \$11 a barrel, starting in February, will be more than double the price that Michigan producers are permitted under FEO regulations.

There is no better example of misdirected Government policy than the disastrous experimentation with regulation of wellhead natural gas prices over the past two decades. One of our mistakes today is that we still are compartmentalizing the "energy problem." Natural gas regulation is looked upon as a problem separate and apart from the oil supply problem. This is a mistake for many obvious reasons, the first being that oil and gas are joint products often occurring in the same reservoirs. They are found as a result of petroleum exploration programs conducted by the same people. And at the consumer end, the availability or unavailability of gas affects the supplies and prices of all fuels. The insufficiency of domestic natural gas has, in fact, been a primary factor in accelerating our dependency on Middle East crude oil.

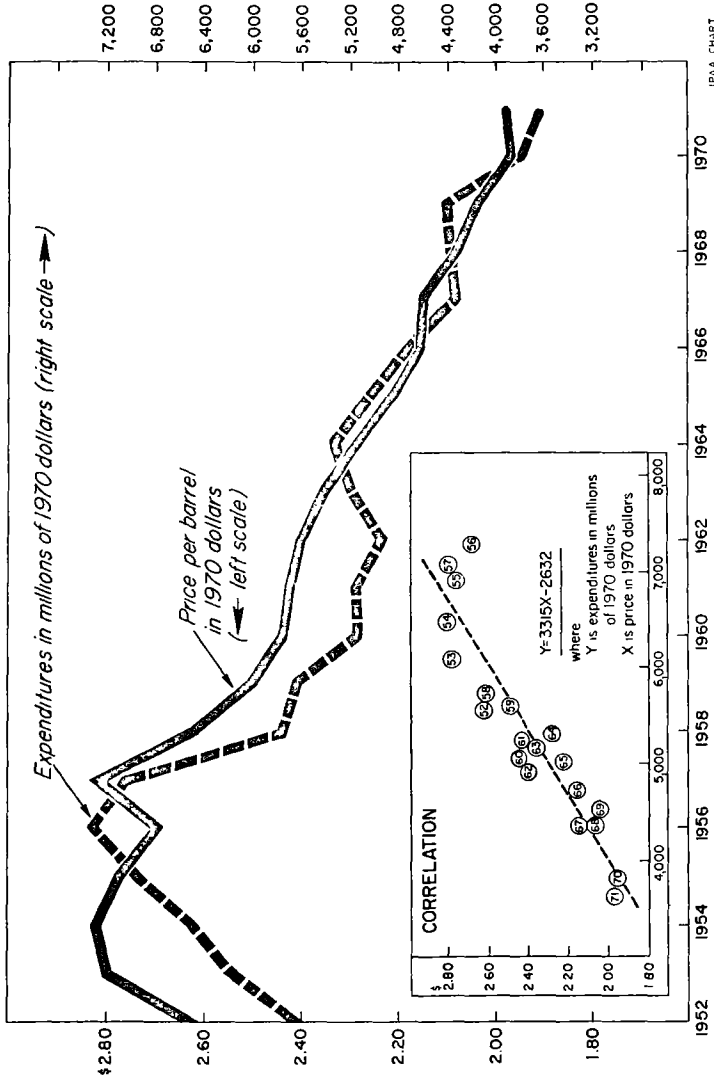
If the Congress would restore the competitiveness of the domestic energy market by removing wellhead price controls on natural gas, I am convinced there would be a significant resurgence in the search for gas, limited only by availability of materials, equipment, and labor. Recent increases in the price of domestic crude oil and natural gas already have brought forth an increase in the activities related to domestic petroleum exploration. The number of rotary rigs active, for example, had risen to 1,440 in mid-December compared with 1,256 in the like period last year, an increase of 15 percent. And there have been numerous reports, in the traditional producing areas of the country, of former producers who quit the business during a 15-year

“private recession” experienced by independents now getting back into active exploration programs.

Typical of such reports was a story in the Tulsa, Okla., *World* on January 13, 1974, detailing an extensive deep-well exploration program by a partnership composed of two men who earlier quit domestic exploration because the rewards did not justify the effort. This story went on to say that one of these partners drilled 40 exploratory well a year in the 1950's but quit in the 1960's for economic reasons. The other drilled his last U.S. well in 1962 then moved to Canada, where he thought incentives were far better. Now, because of improved prices for domestic oil and gas, these former wildcatters are back working at their craft very aggressively.

Such examples as I have just recited illustrate a fact that industry experience has proved over and over again, that there is a clear relationship between oil and gas prices and levels of exploration and development. This shows the industry will reinvest the funds from increased prices without any Government requirement to do so. This relationship, over a 19-year span, is illustrated in the chart, “U.S. Petroleum Exploration and Development Expenditures versus Combined Price of Oil and Gas, 1952-71,” which is attached to and made a part of this statement, Senator.

# U. S. Petroleum Exploration & Development Expenditures vs. Combined Price of Oil & Gas 1952 - 1971



I believe that chart very graphically illustrates that the flow of dollars into the oil and gas business is directly related to the price of the product. We may comment on that a little later, if you care to.

Senator GRAVEL. Is that real dollars you are talking about?

Mr. MILLER. We are talking about 1970 dollars, and we are also talking about the price per barrel expressed in 1970 dollars.

Senator GRAVEL. So the inflationary factor has been taken out?

Mr. MILLER. Yes.

It is our conviction that if the objective of oil and natural gas price deregulation, set forth in S. 2806, were implemented by Congress, that this story of the returning wildcatters would be repeated over and over again, resulting in significant increases in domestic petroleum supplies.

The effects of price controls on oil and natural gas were summarized succinctly in a recent speech by Prof. Edward J. Mitchell of the University of Michigan as follows:

To create a shortage, you simply depress the market price below the level that equate supply and demand; to eliminate the shortage, you free the price and allow it to rise to equate supply and demand once more. To create a surplus, you raise the price above the market-clearing level; and to eliminate the surplus, you let it fall back. We always have three options: a market-clearing price; a price that gives us shortages; a price that gives us surpluses. Our representatives in Washington are presently opting for energy shortages. If we are all decided in retrospect that this was a bad choice, we have the means to change it.

I believe that crude oil and natural gas price controls by the Federal Government have been the most disastrous aspect of past energy policy. I further believe that restoration of a free market would go far toward bringing forth the tremendous capital investments required to close our total energy supply gap. And I believe the market would function effectively to determine competitive and proper prices and to allocate different fuels to their most productive uses.

I believe, in short, that crude oil and natural gas price decontrol would be the most important single contribution that Congress could make toward regaining energy independence for the United States.

#### TAX INCENTIVES AND DISINCENTIVES

Tax incentives have proven to be an effective means of increasing investments of venture capital in the high-risk endeavor of petroleum exploration. Since the 1920's the Congress has recognized the need and justification of differential tax treatment which compensated for the hazards and capital intensive nature of petroleum explorations.

We are concerned that S. 2608 attempts, in its various tax provisions, to go in two directions at the same time.

For example, the concept of an exploration tax credit, an idea that already is applied in other industries to encourage capital investment, would be a useful and effective means of encouraging needed exploration and development. The object of stimulating exploration and encouraging implementation of secondary and tertiary recovery in existing reservoirs is commendable and constructive. With current shortages, it makes sense.

On the other hand, there are two important tax provisions in this bill which would more than negate the benefits to our industry of the investment tax credit. These provisions are the excise tax on unin-

vested profits from energy sources and the tax on energy resources, a so-called B.t.u. tax.

These tax provisions could result in removing significant quantities of capital from the domestic petroleum industry. Thus, with less capital to invest, there could well be a decrease in domestic exploration activity at a time when these expenditures need to be at least doubled if we are to achieve an acceptable level of energy self-sufficiency in the near future.

As to the excise tax, we feel that private industry should be encouraged to reinvest its profits through the maintenance of the proper economic climate. The domestic petroleum industry has a remarkable record for reinvesting the internally generated profits in energy related fields in the United States. Therefore, there is no need for a coercive approach to the reinvesting of such funds.

The British thermal unit energy tax would, we feel, create particular inequity in its application to different fuels. Under the maximum tax anticipated in the 10-year schedule, for example, the tax on natural gas would equate to about 7 cents per 1,000 cubic feet, while it would be about 37 cents a barrel on crude oil. At the moment, a 7 cent tax on natural gas sold at the wellhead at an average of about 21 cents per thousand cubic feet would equate to a 33 percent tax. On the other hand, a 29 cent tax on a barrel of oil, or the B.t.u. tax on a ton of coal at \$1.58 a ton, would represent far different tax burdens with different effects. Lower cost fuels would be heavily discriminated against.

This is but one of the pitfalls of these innovations. Accordingly, the IPAA cannot support the two main tax provisions of this proposed legislation.

#### ELIMINATING DEPENDENCY ON FOREIGN OIL

Recognition in S. 2806 of the unreliability of foreign energy supplies and the objective of limiting and ultimately eliminating dependency on remote and insecure oil supplies controlled by unstable and often hostile government, are commendable and hopefully will gain wide support in Congress.

Independent producers have repeatedly warned for many, many years, before committees of Congress and elsewhere, that declining exploration and development persisting for 17 years would lead inevitably and regrettably to overdependence on foreign oil. We warned repeatedly that so-called cheap foreign oil would be available and cheap only so long as we did not have to have it. For many years, the IPAA letterhead carried the imprint, "There is no security in foreign oil for the defense of our own borders." These warnings, for the most part, were not heeded.

It serves no useful purpose to say "We told you so." Nevertheless, we welcome the increasing but belated awareness now evident of the difficult problem that now is confronting the Nation. The tragedy of it is that it need not have occurred.

When the current embargo is brought to an end, the tendency may well be to fall again into a national lethargy about our dependency on foreign oil. There will be many whose counsel will be, "forget and forgive." It should be clear by now that such a course would be foolhardy. Since World War II there have been more than a dozen dis-

ruptions in the flow of foreign oil. All had an adverse impact at certain points. Only one, the current Arab oil embargo, adversely affected the economy and consumers in the United States.

In previous serious oil crises, the United States went to the aid of other consuming nations. In the 1956-57 Suez crisis, more than 600,000 barrels daily of crude oil from the United States were shipped to Europe for a period of 3 months. As recently as the 1967 Arab-Israeli war, U.S. crude oil production was increased by 1 million barrels daily to offset the disruption of the flow of Arab oil. Because we then still had spare producing capacity, few Americans were even aware of the disruption.

But our spare capacity is not there any more. Domestic crude oil producing capacity is declining, not increasing. Clearly, if our country is to regain a position of strength from which it can exercise a role of leadership, its self-sufficiency in energy must be regained.

We are encouraged that S. 2806 recognizes, we believe correctly, that the United States has adequate energy resources, conventional and nonconventional, to permit the Nation to restore its long-held position of energy independence. We believe the target date of 1985 for reducing our overall dependence on foreign energy resources to less than 5 percent of our requirements is realistic and attainable. In fact, given sound and consistent Government policies, we believe a substantial degree of independence can be restored far in advance of 1985.

#### GOVERNMENT RESEARCH

Both industry and Government have increasingly challenging and costly roles to play in basic energy research. There are many research frontiers in both conventional and synthetic fuels, as well as exotic energy forms. In the years ahead, these research opportunities will require imaginative management teamed with all our known resource and technological sciences.

In the past, most Government research funds have been directed at energy forms other than oil and gas, with petroleum research funded primarily by private industry. The research objectives most discussed in relation to Government's role omit or ignore the possibilities in improved petroleum exploration development, and recovery technology. An encouraging exception is S. 2806, which not only includes but emphasizes fossil fuel research.

Our exploration tools and techniques are directed toward identifying underground structures which, more often than not, are empty of oil or natural gas. Improvements in our tools and techniques for locating oil and gas, which would improve the odds for success in our costly drilling operations, would provide a great stimulus to increased exploration. Improvement in drilling technology and well completion techniques could lower unit costs of reserves found and permit more rapid proving up of potential reserves.

A research area with immense potential for increasing proved reserves of oil in the United States is the recovery factor for oil already found. At the present time, our production or recovery of oil is only about one-third of the oil in place in the underground reservoir. In other words, for every barrel of oil produced, there remains two barrels in the reservoir which are unrecoverable with present technology. If we could merely increase the rate of oil recovery from 30 to



31 percent, a gain of 1 percent of total oil in place, we would add 4 billion barrels to our available supply, and each additional percent would do the same. The needed improvement in oil recovery rates requires additional research and development effort by both Government and industry.

While we believe Government funds should not be expended for commercial energy development and production, we support expanded use of Government funds, both directly and in grants to universities and research organizations, to advance all forms of energy research.

That concludes our statement, and again, I wish to express our deep appreciation for the opportunity to express our views on these important matters.

SENATOR GRAVEL. I want to say, Mr. Miller, your statement is as fine as anything we have had, and certainly has a wealth of knowledge concerning the problem.

Let me now go to some specific questions. Let me first address myself to a philosophical point in the approach, so you can have some feeling as to the approach that we are trying to take in the bill that was introduced.

In one part, I think you are very optimistic about the awareness of the American people as to the fact that we have a problem and that the problem is being solved. The Congress, in my mind, mirrors the American people, since we all stand for election; the general practice is you find out what the people are thinking and to follow the people, which is very safe, politically.

Dr. Mitchell points out in his statement that we are moving toward a policy of shortage which means that the Congress, based upon the rhetoric we have heard, is going exactly the opposite direction of what you recommend in your whole thesis.

Your thesis, as I view it, is based upon facts and actual experience. So I think we must move from the area of what we hope is the situation to the area of what actually is the situation. And I am terribly chagrined when I see in the Gallup polls and the like that 90 percent of the people think that the oil companies are all ripping off windfall profits.

This situation causes Members of Congress who are effecting policy, to take an adversary role against the industry. All the facts that you put before them seems to go to naught, and we are faced with still another dilemma.

That is the dilemma of what perceptions are, not necessarily what the facts are. And the bill that I introduced was more in concert with the perceptions, because I think the facts are as you point out.

So, when we talked in terms of having to place an excess profits tax in the bill, I came across the same problem in looking at the total bill. Here we are structuring something that is to provide incentives to do a job in the profit sector, and to meet the financial obligations needed needed to do a job in the public sector. Then, we have a section which in fact could rob all the other sections of their import. It makes no sense to try to provide an incentive here and take it away there. That is why the excess profits tax section was so difficult to handle.

Realizing the perceptions that exist in the Nation today, not the knowledge of the facts, I'm afraid that you and I could stand here until doomsday and proclaim the facts. But if nobody chooses to accept them, we will only be able to coin the phrase at the bottom of

page 11 in your statement "it serves no useful purpose to say we told you so."

I put statements in the record from industry and from the chairman of the committee, Russell Long, 10 years ago where they were saying exactly what we are saying now, what you are saying now.

It does not do us any good to say we told you so, you told us so. We deal with democracy where people have misperceptions. We employ policy on the basis of those misperceptions. I would hope that your organization could exercise a new judgment in reanalyzing what we are trying to do. That is, that it will serve nobody's ends if we merely sit there and say this is the right way to do it, that is all there is to it.

Policy will not be effected that way. We will see this Nation committed more and more to mistakes and errors of policy. It almost looks as if we are in a situation where people want to see the free enterprise fail so they can turn around and socialize the whole industry.

I think that if you and I and others let that happen, we would be derelict in our duty. Realizing the situation, realizing that Congress is bent upon passing an excess profits tax, we must work to convince the American people of the pitfall of the excess profits tax. To show you how real that is, right now we are locked in a battle on this subject that is going to have a cloture petition facing the Senate.

The House and Senate have already agreed, through committees and floor votes, to excess profits tax. The only way we can overcome it is by showing how terrible a monstrosity it is.

We are not even talking about passing an intelligent excess profits tax. We are just fighting to stop a monstrosity from passing. We have not even gotten to the constructive side of this problem. We are just trying to save ourselves from disaster. That is the reason why we had those hearings this morning and yesterday. I do not know how the vote is going to come out. I do not know if we will be able to persuade our colleagues in the Congress that what we are doing is counterproductive.

But it seems in the demagogy that is going on, that people are just clawing forth. They want to beat on somebody and they want to hate somebody, they want to blame somebody for the mistake. Who is being blamed right today? You and your industry. To recite the facts over and over again does not change this perception.

We have to employ a new tactic. So, in the design of this excess profits tax, what we have done is say we will permit you the same profit that most healthy, vigorous industries are exercising. We are getting some data to determine what some rates of profitability are, but the cutoff we used was 20 percent.

Your industry has not seen that kind of profitability.

We received testimony from Chase Manhattan Bank that an 18-percent profitability would permit your industry to finance itself in its customary fashion in order to reach certain goals. That is, as you point out, if you can get enough profit, it will be worthwhile to operate.

The industry will reinvest profits into productive capacity because this is what they know best. If they can make a profit at it, they will do it.

But, if the industry which will benefit from this proposal does not back it up, there will be nobody who is pushing for what might be

an acceptable, livable type of excess profits tax. If there is nobody for it, I know it is not going to pass.

This is the dilemma I propose to you, sir. There is going to be an excess profits tax. It can be a bad one, or it can be a good one.

Can you live with the one that I am trying to suggest in this bill, that is, with a base of 20-percent profitability? The first 20 percent you can do whatever you want with. But, above that 20 percent, you have to reinvest it; otherwise there will be an increase in the rate of taxation which would be somewhat severe, to try to discourage you from doing that.

Does this seem unreasonable? Is there any chance that we could get support within the industry for this kind of situation?

Mr. MILLER. If I may, let me make a couple of observations on your statement, and not necessarily directly to the statement you are making, but observations of your other colleagues of recent dates.

You direct a question, can I live with it. Senator, I would like to assure you that I could probably live with anything you come up with, or your colleagues come up with, because I do not have to be in the oil business.

I think the bigger question, and the one that I hope some of your colleagues would address themselves to, is can the United States live with what they propose?

Because I would like to see some statesmanship exhibited by some of those persons, rather than political devices that they have been employing. It is extremely disheartening to me to see statements taken out of context when the facts are so readily available in many instances. These things are played up to the media with no apparent attempt to try to discern what needs to be done to answer our problems today.

I am not here pleading for John Miller or Miller Bros., or necessarily for the independent sector of the United States, insofar as the Independent Petroleum Association of America is concerned. We are trying to make what we feel is a factual presentation. This is a capital-intense industry. We need more dollars. You can reduce this thing to a simple equation, you have to have more money to find more oil and gas. We have taxing mechanisms which are about right, now. If it is felt that the oil business is so highly profitable, what has made people get into the oil business?

I will pursue that on through. It was a desire to succeed. If the development of oil and gas is going to be highly profitable, it would follow then that as the profits are made it would continue to be plowed back to make more profits. As this plowback goes ahead, yes, there will be profits. But there will also be the development of the oil and gas that we vitally need to operate as a country.

The other thing is, so frequently the directing approach here is only to consider those eight companies or some larger group pre-defined, when 85 percent of the wells in the United States are drilled by the independents. So when we devise a tax we have to have it structured in such a way that in the attempt—if that is the attempt of some of Congress, to cut the legs off the major oil companies—that we do not decimate the entire industry at the same time. I am not here to defend the major oil companies per se. I think they can defend themselves well enough. But I do believe that we need to look at the priority here, and the priority, if I understand it correctly, is to try to develop

the natural resources of the United States to a point where we might become self-sufficient or as near to that goal as possible. And to do this we have to afford them the best economic climate.

What I am saying here, is to remove those things that detract from the economic incentives to go out and find additional oil and gas, and as those are found with a proper price we will also find the other fuels coming, shale oil, coal gassification, et cetera. Then we will make strikes. But, if we are trying to find ways to diminish the economic incentives, we are not going to make any appreciable gains in the development of our resource base. That is my concern.

Senator GRAVEL. I share that total concern.

Let me just state that I appreciate that you, your company, and the whole industry have been successful and at any point can branch into other fields. I do not think that this would be in the best interest of this Nation. I think that we do pick up a lot of technology, a lot of expertise, a lot of talent from people who devote their lives to this activity. What this Nation needs, as you pointed out, is more people who have this talent. I would hope that we might develop some understanding on the part of the oil organization as to what we face, those of us who are going to be characterized as sellouts or defenders of the oil companies like myself.

I sat here, and Mr. Simon was very complimentary in his statement that I was the only one who was willing to challenge the statements made concerning the profitability of Exxon. They just had their annual meeting today, and they released their figures. These figures were not windfall profits. It is not our desire to just get the major oil companies. That is a mistaken perception as to what will solve the problem that this Nation faces.

Unless we can understand that perception and compromise, you and I do not have a chance to get policy going in the right direction. If it goes in the other direction, it will wipe out the energy industry as you and I know it. I do not think that is in the best interest of our country. So when I put forth an excess profits tax, it is only with the realization that if I do not take the initiative to put forth something that can work and permit industry to expand under our concepts of free enterprise. Otherwise we will be saddled with an excess profits tax that will do exactly the opposite of what we are trying to do; that is, increase the capital.

I could not agree more with you that it is as simple as you say. You want oil. It costs money to get oil. There are two ways we can do it as a country. We can turn around and let you do it within the spirit of private enterprise, or we can nationalize the companies, buy out your rigs. You will have to get out of the business with no profits. The Government will then take the rigs over. They will hire bureaucrats who will work for the Government. They do this in the Soviet Union.

This is where I think the Nation is at the brink, and I think it is very, very serious.

Mr. MILLER. May I insert here, Senator?

You cited the Soviet Union. They happened to have, of course, a somewhat different political philosophy than espoused in this country. But outside of that illustration, there are other countries that have also nationalized their oil business. It would be interesting to follow those trends to see how close they become to self-sufficiency or even operative.

Senator GRAVEL. They have been total failures.

Mr. MILLER. Yes, sir. They have been excepting but one place. If we are willing to buy that total concept it is entirely possible that a Government oil company would be successful. But short of that——

Senator GRAVEL. What place is that that you know of?

Mr. MILLER. The Soviet Union.

Senator GRAVEL. That is if you want to change your economic system.

Mr. MILLER. If we are not going to buy that total concept of economic life, then we will not have a nationalized oil industry that is successful, either.

I would like to point out in 1963, in January, I sold oil for the identical price that I sold it for in January 1957. Strangely enough, during those years no one called a hearing to understand the plight of the oil producer, or whether or not we were going to be able to sustain any degree of self-sufficiency.

I am looking at a chart here that indicates in 1959 in actual dollars, not reduced by anything—inflation, or anything—in 1959, U.S. crude oil prices at the well, per barrel, \$2.90; 1960, \$2.88; 1961, \$2.89; 1962, \$2.90; 1963, \$2.89; 1964, \$2.88; 1965, \$2.86; 1966, \$2.88; 1967, \$2.91; 1968, \$2.94. I do not want to belabor you and take your time but we all know what happened to other costs during that time, and here we were locked into that particular price position.

I have already discussed the gas pricing mechanism during that same period of time. I would submit to you today, and to the rest of the people who are concerned about the cost of gasoline and other products derived from petroleum resources, that if they crank that into the mill compared with the comparable cost to other things that they are enjoying today, clothing, food, transportation, homes, salary, they will find that gasoline is not overpriced at 60 or 70 cents a gallon. Gasoline is not overpriced in that comparison. Last year a survey indicated that if you took the average wage earner's hourly rate—I think, it was \$3.81 an hour—last year—that wage earner could buy more gallons of gasoline per hours wage earned than at any previous time. We are not overpriced to any degree.

We have lived in a fictitious never-never land for 17 years. Now we are having to face reality. This is a painful experience. It is painful for everyone.

Senator GRAVEL. How do we tell the public that we are still in never-never land and at the same time trying to chart public policy?

Mr. MILLER. At one time I thought progress was being made. This was up until about 3 weeks ago. Since that time, there has been a tremendous turnaround on the part of many Members of Congress. I wish I could explain where the failure is. Undoubtedly, it has something to do with the industry's failure to tell the story. We have attempted to, but apparently, we have not been successful in our communications.

As to your proposal on the British thermal unit tax, I would like to comment on that. That tax, if I understand how it is structured, is set up in such a way that it is a tax that would be applied to the producers at the point of severance, is that correct?

Senator GRAVEL. Yes. Let me expand on it for a moment. The tax would apply to all types of energy. The concept behind it is that if we are going to do something in the public sector that involves cost and

moving forward in energy, we apply this tax equally. Here again, there is a lot of talk on Capitol Hill about a tax. This in my mind seems eminently fair.

With regard to the point that you raise in your statement concerning the cost of gas, I have a view that this will reward efficiency because if you take a British thermal unit cost and apply it to gas. As gas is more efficient to oil, then in point of fact the consumer would be paying less for a more efficient fuel in terms of tax. I do not see any reason why we should just talk in terms of taxes on fossil fuels, because this British thermal unit tax will also apply to TVA hydro generators.

You take a hydroelectric generator such as the the Bonneville Dam and the British thermal unit ability of that generator which is not a difficult thing to do. As it produces British thermal units, you would then affix the tax to it. So the person who is paying for this electricity in his home that comes from the Bonneville power generator, will be paying a British thermal unit tax on energy. If there is a nuclear generator in Chicago or Detroit, that nuclear generator is selling power to the local utility company. At the nuclear powerplant, you will give the generator a British thermal unit rating. Based upon that rating—every second it is producing those British thermal units—a tax will be applied right there at the generator. Therefore, the person who is paying for the electricity bill will be paying for that British thermal unit cost.

Mr. MILLER. It is a passthrough, Senator?

Senator GRAVEL. Of course. I assume all taxes are passthrough. My economic training tells me that people are in business to make a profit. If they do not make a profit, they go bankrupt. If they go bankrupt, then they do not get the opportunity to hang on, and to passthrough the next time around.

Mr. MILLER. As it was structured, and as I read it, perhaps erroneously, I thought it was a producer-paid tax. I did not understand the passthrough concept.

Senator GRAVEL. I would not make that proposal if it could not be passed through. If the British thermal unit tax passed without deregulation, I would oppose it on the floor of the Senate. It would make little sense to tack a tax on the source, and then turn around to stop the utility or industry from passing it on through to the consumer. In my mind that is a sure way to strangle the industry. It is ridiculous, and I would not propose it. It has to be passed through.

Mr. MILLER. There are some peculiarities in the British thermal unit tax concept on crude oil production. I assume they could be worked out. One of the peculiarities is, of course, that lower gravity crude oil suffers a price disparity because of the lower gravity as opposed to higher gravity crude oil.

SENATOR GRAVEL. On crude oil we would evaluate the oil. And I think you know more about this than I. But as it was explained to me, we have a type of well that produces oil which can be rated on a British thermal unit basis. Thus that two wells may both produce, let us say, 1,000 barrels a day. But because of the type of oil they produce they may retain different taxes based on the British thermal units.

The oil would be rated so that the tax per British thermal unit would be consistent.

Mr. MILLER. My point is this. Let us use 40 gravity as an illustration. If 40 gravity oil is priced at \$5.02, and another oil is 32 gravity, the differential from 40 down to 32 will make a price for 32 gravity oil less, just to use an illustration, say from \$5.02 to \$4. Normally, the lower gravity crude oil has a higher British thermal unit content per barrel. It is one of the peculiarities. So here would be a lower price crude, then, suffering a higher taxation.

Senator GRAVEL. The tax would be less, as we have it written here. You are enlightening me. Let me see if I understand you. You are saying that a 40 gravity, as opposed to a 30 gravity—has a lesser British thermal unit content?

Mr. MILLER. Yes. But yet, in the marketplace—let us use a \$5.02 again for the 40, and say \$4 for the 30. With a lower price you are going to be netting lower amounts of money for that disparity in gravity, yet it has a higher British thermal unit content, if I understand your concept right.

You would have a multiple going on that British thermal unit content that would make your \$4 oil actually subject to more tax than your \$5 oil.

Senator GRAVEL. If your lower gravity produces more British thermal units and you tax it on a British thermal unit basis, then it would make no difference at all. The consumer actually would have the advantage that if he bought the lower gravity—though the tax would be the same on a Btu unit basis on an efficiency basis he would be better off. It would just be the other way around. If both taxes on the 40 and the 30 for a barrel were the same—let us say it amounted to \$1 for one barrel—when you carry that forward, the consumer is paying more tax for an inefficient product on a higher gravity. But under the proposal that we have, the tax would be scaled into the British thermal unit rating, so in point of fact you would be paying—correct me if I am wrong—let us say, if he is paying \$1 a barrel for 40 maybe a barrel of 30 would be \$1.20. That would be the total tax, because it is producing more British thermal units.

Mr. MILLER. Let us go at it this way. If you take \$5 oil, 40 gravity—let us assume, then, you are equating this tax to 1 million British thermal units.

Senator GRAVEL. Let us say \$5 oil and it has a million British thermal units.

Mr. MILLER. What is your tax going to be per barrel?

Senator GRAVEL. Let us say that the tax would be, 2 cents per British thermal unit, just for the sake of computation; 40 gravity oil with a lesser British thermal unit rating would have a lesser tax.

Mr. MILLER. That is my point, the lower gravity oil has more British thermal units and it is going to be priced lower in the marketplace. So on an equation here you could end up paying a higher percentage and a greater net tax on the lower priced oil than you would on the higher priced oil.

Senator GRAVEL. Let us stay on this a minute because if you can discover where a mistake is being made, we will change it. I want to make sure we understand what we are doing.

Let us go back to the chart again. On one hand we have a 30 gravity, \$5 a barrel, a million British thermal units per barrel oil. The British thermal unit tax is applied on all units at 2 cents per British thermal unit. On the other hand we have 40 gravity oil with 800,000 British thermal units per barrel. It means the total tax on that of 40 gravity barrel is less than it was on the other barrel.

Mr. MILLER. What you fail to take into consideration is the point I am making. They would not be priced at the same dollars per barrel. Because of the lower gravity, that oil would already have suffered a price disparity. It is a markdown. If 40 gravity oil is going to sell at \$5, 30 gravity oil, let us say, is going to sell at \$4.

Senator GRAVEL. In this example we have here, since we have priced 30 gravity at \$5, what would 40 gravity sell for?

Mr. MILLER. The price differential I think it is about 2 cents per degree. It is more than that now, 3 cents per degree of gravity. It would be 30 cents differential for the 10-degree gravity differential.

Senator GRAVEL. Let us say 50 cents. The barrel of 40 gravity would sell for \$5.50 and 30 gravity for \$5. From the British thermal unit rating point of view the 30 gravity has a million British thermal units, and the other one, the 40 gravity has 800,000 British thermal units. So if the tax is constant on a British thermal unit, you just multiply the number of British thermal units by 1 million, and the other by 800,000. It is not altered by the sale price of oil. In fact, we are not even concerned with that, since we have evaluated the tax on the basis not of price, but on the basis of its heat unit.

This 30 gravity barrel of oil here would pay more tax. This would generate more tax revenue because we are getting more heat out of it. The constant applies to the British thermal unit. It does not go any further than that. So though there is a disparity in the industry because of gravity, it does not affect our problems of taxation, nor does it affect any discrimination on the better or lesser quality. So in the field when we want to apply this tax, you ask, what is the gravity of oil and what is the British thermal unit content, and I am sure that they can tell us. When it is evaluated, you can compute what it is really worth.

Mr. MILLER. What I would like to do is get some specifics for you, gravity differentials and particular fields and price disparities, crank in your factor, and see if we can illustrate this.

Senator GRAVEL. I would appreciate it if you would do that for the record because this was the only problem in our own discussions where we had some difficulty.

We understand it very clearly, but that does not mean that we are right. If there is a hole in our thinking, you will do us a service, to let us know before it gets to the floor of the Senate.

Mr. MILLER. We will attempt to furnish you that information by tomorrow.

Senator GRAVEL. If you need additional consultation, certainly Mr. Best would be available. We view the tax on that basis.

[Mr. Miller subsequently submitted the following:]



INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA,  
Washington, D.C., February 8, 1974.

HON. MIKE GRAVEL,  
Chairman, Subcommittee on Energy,  
Washington, D.C.

DEAR SENATOR GRAVEL: On January 23, 1974, during my testimony before the Energy Subcommittee, I requested permission to submit additional information concerning the inequity of the Btu tax on heavier crude oils relative to lighter crude oils as proposed in Section 4496 of S. 2806.

Crude oil is valued by purchasers (refiners) for its content of the lighter and more valuable petroleum products namely, gasoline, jet fuel and middle distillates including diesel fuels used in transportation. For this reason, the lighter gravity crude oils command a higher price than do the heavier gravity crude oils even though the lighter crude oils contain fewer Btu's per barrel than the heavier crude oils. The posted price schedules for crude oil, in most instances, contain a penalty of from 2¢ to 5¢ per degree of gravity differential below the stated crude posting for say 35 to 40 gravity crude oil.

Following is an example comparing the Btu content for a 20, 30 and 40 gravity Wyoming crude oil together with the posted price for the different gravities. In this case, the gravity differential is 5¢ per degree for crude oil below 29 gravity; 4¢ per degree for oil from 29 gravity to 36 gravity; and 2¢ per degree for oil from 36 to 40 gravity. The Btu tax used for each million Btu namely, 4.1¢ is as proposed in S. 2806 as of July 1, 1974.

Gravity degrees API:	Btu's per barrel	Btu tax per barrel (cents) <sup>1</sup>	Posted price per barrel	Btu tax as percent of price
20.....	6, 220, 200	25. 5	\$4. 34	5. 9
30.....	5, 955, 600	24. 4	4. 83	5. 0
40.....	5, 703, 600	23. 4	5. 15	4. 5

<sup>1</sup> 4.1 cents per million Btu.

The 20 gravity crude oil in this example sells for \$4.34 per barrel and the Btu tax would amount to 25.5c or 5.9 percent of the posted price. The 40 gravity crude has a posted price of \$5.15 even though this oil contains less Btu's than the 20 gravity oil. Accordingly, the Btu tax on the 40 gravity oil would be 23.4c per barrel or 2.1c per barrel *lower* than the cheaper priced 20 gravity oil and would equal only 4.5 percent of the posted price.

If the crude oils contained sulphur, and undesirable element in crude oil which classifies a crude as "sour" rather than "sweet", the tax inequity would be compounded since the sulphur content raises the Btu's per barrel. The Btu tax paid on this less desirable "sour" crude would therefore be higher than similar gravity sweet crude which carry a higher wellhead price posting.

I trust that this explanation of certain inequities in the Btu tax proposal contained in S. 2806 will be helpful in the consideration of the Btu tax proposal.

Sincerely,

C. JOHN MILLER.

Senator GRAVEL. The basis of the test is to pay for the public effort. Here again there is a lot of rhetoric about spending money, but I found if you do not put up the money, it does not get spent. It just becomes window dressing.

Your statement did hit some new ground and facts that I have not seen and facts that we intend to use in debate. In fact, I am going to use the Mitchell quote tomorrow in our caucus because there is going to be an effort made to try to get us to go on record for a price rollback. I think that Professor Mitchell, whom you quote from Michigan State, states the alternatives most succinctly.

What is the average cost of producing oil in the United States today? Do you have any idea?

Mr. MILLER. Naturally I would have to use an estimate. You are talking about domestically produced oil?

Senator GRAVEL. Yes.

Mr. MILLER. I think at this time our estimate of average U.S. crude oil prices would be in the range of \$6.50 per barrel.

Senator GRAVEL. The cost of producing?

Mr. MILLER. The cost of producing? I do not have a number for that.

Senator GRAVEL. Is that something you could acquire? We need somebody to get that to us so we have it in the record. If you could help us out in that regard, we would appreciate it.

Mr. MILLER. Anything that I could find I would be glad to furnish for you. I do not know if I have that type of information.

Senator GRAVEL. Perhaps what we could do is this.

Realizing the lateness of the hour, I do not want to keep you any longer as you have been very kind and patient. I would like to submit to you a list of questions that will be of a technical data nature. If your organization can answer them in a reasonable period of time, and within your reasonable cost constraints, it would be most helpful.

So, if you are willing, we will send a list of these questions to you by tomorrow morning, so we can expand our own record here.

Mr. MILLER. We would be pleased to develop all, or any of the answers, that we could do.

Senator GRAVEL. This would be of service to us. As you know, we are trying to make a case for intelligent policy and we can only do this with continued repetition of the old facts and new facts more interestingly presented.

We will be submitting questions the way we are receiving them so we can put them forth in that way.

[The following subsequently received for the record:]

RESPONSES BY THE INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA TO  
QUESTIONS SUBMITTED BY SENATOR GRAVEL ON JAN. 23, 1974

Question. What is average cost per barrel of producing oil in U.S.?

Answer. There are order of magnitude figures on the industry's costs. For example, the Joint Drilling Cost Survey of the IPAA, API and Mid-Continent Oil & Gas Assn. discloses that the domestic industry spent \$10.677 billion for exploration, development and production in 1972. These expenditures were made to find, develop and produce both crude oil and natural gas.

Real difficulty arises in attempting to attribute costs to natural gas production vis-a-vis crude oil production. Individual producers have not found an acceptable means of allocating these joint costs, much less the entire industry. Another problem arises in that there is never an accurate measure of how much oil and/or natural gas has been found in any given year. Neither the government nor the industry, therefore, has been able to determine on a per barrel basis the average cost of finding, developing and producing a barrel of domestic crude oil.

Question. How do you account for the decline in exploratory drilling since 1956?

Answer. The decline in domestic petroleum exploration can be attributed primarily to government's efforts to hold the prices of petroleum fuels, oil and natural gas, very low. Since 1954 prices have been controlled directly in the case of natural gas. As a condition of the Oil Import Program implemented in 1959, domestic crude oil prices were controlled by government coercion under both Democratic and Republican administrations.

These long years of depressed and inadequate prices brought two predictable results. (1) they accelerated demands for oil and natural gas and (2) precipitated a constantly declining search for replacement reserves of both of these fuels.

Inadequate prices, held down deliberately by government action, have been widely recognized as a primary influence in bringing about shortages of these essential fuels.

*Question.* How important is the depletion allowance *vs.* intangible drilling as an incentive for independents to drill?

*Answer.* The percentage depletion provision and the option to expense intangible drilling costs are both highly important to the independent oil and gas producer. These two tax provisions serve entirely different purposes. Deductions for intangible expenditures cover only non-recoverable capital outlays expended by producers in drilling and well completion operations. Thus these deductions are rightfully intended to cover lost and non-recoverable capital expenditures, a principle by no means exclusive to the petroleum industry. The percentage depletion provision, on the other hand, is intended to return to the successful producer, untaxed, a portion of his capital resource represented by oil and gas in place in the underground reservoir. This provision sets aside a portion of the producer's revenues which can be used in new exploration to develop new resources replacing those currently being produced and consumed.

In the operations of independent producers, both of these tax provisions are vital, and both have repeatedly been examined and justified by the Congress.

*Question.* What is current situation on availability of rigs, pipe, casing, etc?

*Answer.* The situation now confronting the domestic petroleum producing industry is similar to that which occurred immediately following World War II: In response to improved economic conditions, a resurgence of exploration and drilling is under way and producers, as a result of this intensified activity, are experiencing some shortages of pipe, rigs and equipment. These are not, however, insoluble problems. If the increased level of exploration and drilling is maintained, these shortages will be satisfactorily resolved, just as they were following World War II, when well completions in the United States increased sharply, rising from 24,600 in 1945 to 58,160 in 1956, an increase of 136 percent. In increasing its activities on this scale, the industry experienced shortage situations, but none which was not overcome. Concern about material shortages should not now be a major concern in expanding our resource development in the future.

*Question.* What is current labor supply situation in producing area?

*Answer.* In drilling and exploration, the domestic petroleum industry is experiencing some labor shortages which vary from area to area. The decline in industry activities since the mid-1950s has been accompanied by a tremendous loss in skilled personnel in the petroleum producing industries. For example, employment in oil and natural gas producing industries in the United States declined from a total of 344,000 in 1957 to about 261,900 in 1972. While personnel problems are a concern, they will, like the current material shortages, be resolved over time.

*Question.* Do you feel the present bonus bidding procedures for federal lands make sense? How much offshore drilling is done by independents?

*Answer.* The Independent Petroleum Association of America has studied federal procedures for leasing federal lands on the Outer Continental Shelf, but has not arrived at any firm recommendations for change. However, many in the independent sector believe that the present bonus bidding procedures (a) tend to make offshore drilling the almost exclusive preserve of the large industry units and (b) remove from the industry large capital sums which could—in view of existing oil and gas shortages—be more productively put to use in petroleum exploration and development. Up to this point in time, participation by independent producers in offshore ventures has been minimal. Those independents who have participated have done so through joint bidding ventures involving eight or more companies.

Senator GRAVEL. In closing, Mr. Miller, let me thank you very, very much. I would also like to readdress myself to the point that we moved away from when we talked on British thermal units. You have stated facts that exist. Some of them are immutable. I see those same facts, and realizing that we are in a danger of making wrong policy decisions. However, we are trying to effect a compromise here and this may seem unreasonable. But realizing what is going to happen if we do not try to effect a compromise, we may have to be satisfied with a less than perfect settlement.

And that is only a partial solution but important because I want to see you stay in the oil business. I want to see you prosper in the oil

business. I want to see your whole industry prosper because I think these people and you have developed the expertise to serve our free enterprise system in this Nation well, even with the poor policy that we have experienced in the last 15 years.

Mr. MILLER. Thank you. We are equally concerned about the possible passage of the windfall profits legislation. I hope that someone pays attention to the facts that have been developed on this, and the input that has been given.

There is no way that we will ever become even reasonably close to self-sufficiency in the energy field with that type of legislation. It is not possible.

Senator GRAVEL. I would like you to take back to your organization the proposal I have on the excess profits tax with that 20 percent profitability and canvass them on their opinions concerning it. I happen to think it would be better for the industry and better for the American people than the proposal that has been put forth by the administration. Their proposal still relates to price, not profitability. But it is from profits that we are going to finance and receive the capital to do the job.

So, I hope your organization could take a look at it. I can only say if we do not have their support, we will not see any compromises that could be beneficial.

Mr. MILLER. Thank you, Senator.

Senator GRAVEL. Thank you, Mr. Miller, for your efforts and your time and your statement which is going to be very valuable in our deliberations.

Mr. MILLER. Will we be able to secure those questions this evening?

Senator GRAVEL. We will be able to give you some or most of them right now. Mr. Best will give them to you, and you could have 1 week or 10 days to respond.

Mr. MILLER. Thank you very much.

Senator GRAVEL. Thank you very much.

The hearings will be in recess until 9:30 tomorrow morning.

[Whereupon, at 4:50 p.m., the subcommittee recessed to reconvene at 9:30 a.m., Thursday, January 24, 1974.]

# FISCAL POLICY AND THE ENERGY CRISIS

THURSDAY, JANUARY 24, 1974

U.S. SENATE,  
SUBCOMMITTEE ON ENERGY  
OF THE COMMITTEE ON FINANCE,  
*Washington, D.C.*

The subcommittee met, pursuant to recess, at 9:45 a.m., in Room 2221, Dirksen Senate Office Building, Senator Mike Gravel (chairman of the subcommittee), presiding.

Present: Senators Gravel and Dole.

Senator GRAVEL. The hearings will come to order.

These hearings are concerned with the use of fiscal policies to shape an energy program for this Nation. There is no task presently facing the Congress that is more important than determining a policy to guide our energy production and consumption.

Right now, we seem more concerned with laying blame than we are with solving the problem. The mistakes of the past should be studied. They can provide a lesson for the present and for the future. But we must be watchful that this preoccupation with blame does not become a substitute for finding solutions.

In my view, the mistakes of the past fall with almost equal burden on both the corporate and governmental policymakers. In reality, neither Government nor business have ever made policy. Instead, they have made decisions based only on the considerations of the moment.

Our Nation's policy, if it can be called such, is designed only to keep energy cheap, to encourage consumption, and not to worry about where it is coming from.

We are now paying the price for these decisions. For the Congress to blame the Executive or for the Executive to blame the industry is irrelevant. There is more than enough blame to go around. It rightfully rests with all of us. Let us accept it and get on with the task of assuring that we do not make such mistaken decisions again.

In formulating a national energy policy, we have one basic choice to make before all others. Who will pay the bill?

Ultimately, of course, the American people in our dual roles as taxpayer and consumer will bear the burden. The question is whether the attainment of the goal of energy self-sufficiency rests with the efforts of Government or with the efforts of industry.

There are some who say that private industry has so botched the job that Government must step in and take over. There are others who are willing to place their future completely in the hands of industry.

We cannot afford the luxury of such an "either-or" choice. Realistically, there are some tasks that we cannot expect of private

industry that Government will have to handle entirely. But there are others that industry is well equipped to handle. I, for one, do not want to see the U.S. Government get into the oil business.

In shaping our energy policy, we must give attention to both the role of Government and the role of private industry. That policy must include provisions to assure that the work of private industry will be consistent with national goals and with the Government's own efforts. Only a policy that meets this criteria will make the nation reasonably self-sufficient in energy within a decade.

Our policy must look to the intermediate and long-range development of our energy resources, as well as the short term management of the crisis. Administrator Simon has been doing a magnificent job of managing the enormously complicated problems facing us immediately.

We should now start focusing our attention on the crisis beyond this winter. For the long term, I have suggested a series of steps embodied in the S. 2806 that can provide the financial basis for an energy policy.

That proposal would establish an energy trust fund to finance the Government's efforts in energy development. It would be managed by the Federal Energy Administration which would have overall responsibility for coordinating energy policy. There would be a public watchdog panel to oversee the Government's efforts.

The bill, through a number of items, would encourage the private sector to develop domestic energy resources without allowing excess profits. Walking a tightrope between encouraging the private sector to produce and discouraging excess profits will require the wisdom of a Solomon, or a Simon. But we must be certain that our necessary steps to keep profits in line do not have the unfortunate effect of discouraging energy development.

We have a distinguished group of witnesses appearing during the next few days. The first on our agenda today is the very able administrator of the Federal Energy Office, William Simon.

**STATEMENT OF HON. WILLIAM E. SIMON, DEPUTY SECRETARY OF THE TREASURY AND ADMINISTRATOR, FEDERAL ENERGY OFFICE; ACCOMPANIED BY GERALD PARSKY, EXECUTIVE ASSISTANT TO THE ADMINISTRATOR; JOHN SAWHILL, DEPUTY ADMINISTRATOR; AND FREDERICK HICKMAN, ASSISTANT SECRETARY FOR TAX POLICY, DEPARTMENT OF THE TREASURY**

Mr. SIMON. Thank you, Mr. Chairman.

I want to compliment you on the first portion, especially, of your opening comments, and I would ask your permission to be able to plagiarize portions of that because I think that bears repeating and repeating. Unfortunately, we do have to repeat ourselves quite often with respect to the blame syndrome that seems to have captured everyone today, and I think the important job that we have is to say, all right, let's take cognizance of what occurred. Hopefully it will not occur again when we realize what the facts of this very complex matter are. Let us not lose sight of the job that has to be done right now.

I am pleased to be here today to discuss the Energy Revenue and Development Act of 1973 and, beyond this, how the administration plans to resolve the long term energy problems facing our Nation. The bill is a comprehensive piece of legislation and I plan today to identify those features of the bill which we support and those about which we have some reservations or modifications.

Before doing this, I think it would be useful to outline, briefly, the five-fold approach we are taking with respect to energy policy.

First, we must establish a central energy organization in the Government. The creation of the Federal Energy Office is the first step toward bringing all energy policy under one roof. We certainly need a statutory base for this organization and the pending FEA bill, which has already passed the Senate, will provide it. However, we must press forward in the creation of a cabinet level Department of Energy and Natural Resources to bring together all energy-related responsibilities.

Second, we must establish a permanent conservation ethic in this country. We have been too extravagant in this country; with but 6 percent of the world's population, we consume 35 percent of the world's energy. The recent embargo has forced us to reduce this consumption, and we must be sure that an attitude of conservation becomes a permanent part of our lives.

Third, we have to push forward in the development of our domestic energy resources, through Project Independence. This includes further development of oil and gas in Alaska and the Outer Continental Shelf, greater utilization of coal, of which we have a supply unmatched by any other country in the world, further development of oil shale and nuclear power, and added efforts toward development of geothermal and solar power.

Fourth, we must forge a new relationship between Government and industry. Our energy policy calls for a joint effort between Government and industry as we seek to develop our domestic resources. Further, we need industry cooperation in providing adequate information about the energy situation. The information we now have to work with is not adequate and its reliability cannot be checked.

We must develop a permanent energy information system with a built-in auditing program on every aspect of the energy situation, reserves, refining operation, inventories and production costs, so that we will then be in a better position to assure the American people that our energy data is accurate and not subject to the charge that it can be manipulated by industry.

Fifth, we must establish a framework of international cooperation among producing and consuming countries. The potential impact of shortages of energy supplies on the world economy is staggering and we must strive for a compatibility between our domestic policy and international relations. Thus, we must seek international cooperation with respect to conservation efforts, research, and development, and pricing policy. We must work together in developing energy resources and maintaining a healthy world economy in which energy exporting and energy importating nations prosper together.

#### DEVELOPMENT OF SELF-SUFFICIENCIES

With this general framework in mind, let me turn to the specifics of our energy policy and the relationship of this bill to that policy. Our

Nation has become aware of energy shortages in an atmosphere of crisis. That is not to say that there were not adequate warnings. Many have been warning about the potential shortage for years and I have been testifying with many others and giving speeches about it for months, but it took the embargo to wake us up. Because of that embargo, we have had to consider emergency taxes, we have had to allocate petroleum and petroleum products, we have had to institute many voluntary or mandatory conservation measures and we have had to put into place a standby rationing program.

Although the current embargo and the resulting shortage has thus awakened us, it is important to realize that our energy shortages have been developing over the past two decades. Let me briefly review with you how this happened.

For many years the United States has been the leader in the development of energy sources. We were among the first countries to apply nuclear power and have since exported our nuclear technology to scores of countries. American equipment and manpower are used for drilling, processing, refining, and delivering oil throughout the world. Yet, in recent years, domestic supply has not kept pace with demand. Demand has been rising at an annual rate of 4 to 5 percent. However, domestic exploration peaked in 1956 and domestic production peaked in 1970. There are a number of reasons for this.

The exploration and development of both the North Slope and the OCS has been delayed in part because of the failure by the Government to expedite leasing and in part because of litigation which not only prevented timely construction of the Trans-Alaskan pipeline but also prevented OCS lease sales for 2 years.

Until April, 1973, the Mandatory Oil Import program's volumetric quota system discouraged construction of refineries in the United States. Further, environmental restrictions have delayed construction of refineries.

Most of our natural gas resources lie unused and, in many cases, unexplored as the result of Government regulation of the well-head price of natural gas.

Nuclear power, in which rested so much hope a decade ago, still provides only 1 percent of our energy needs after 30 years of development. It could provide 10 percent by 1985 if we make the necessary commitments now.

Perhaps one of our greatest failures is that this Nation, with 53 percent of the world's coal reserves, has not properly exploited this wealth, largely because of economic factors as well as environmental constraints.

We need not continue as we have. Our Nation has always risen to meet serious challenges to our economy and security. The experience of the United States with synthetic rubber during World War II provides an appropriate example. The United States was consuming upwards of two-thirds of the total world consumption of rubber. The UK, which controlled 75 percent of the world's rubber, instituted export restrictions. By holding back on exports, they were able to raise the price paid for rubber from 14 cents per pound to \$1.23 per pound.

In 1941, the Government and industry undertook a massive effort to develop synthetic rubber, and by 1944 not only was the total annual



output enough to satisfy demand, but the quality of the products was far superior.

Just as in 1944, we can now demonstrate again that a genuine industry-Government commitment can bring us self-sufficiency. There is no reason why we cannot achieve this. We have the technical competence. We have the natural resources. What we need is leadership and funding to launch a concerted long-term program that will increase our production and conserve our use of energy.

This program must be a two-pronged attack. In the short run, we must both expand production and exploit untapped reserves of existing energy sources. Longer range solutions will be provided by the development of new technologies to utilize untapped resources of new and existing fuels.

Specifically, this program should include the following:

We have to find ways to exploit our coal reserves more effectively. We have 1 trillion 500 billion tons of identifiable coal reserves, or half of the non-Communist world's reserves, 425 billion of these are economically recoverable now. We must develop ways to utilize this abundant resource.

We must develop techniques for mining surface coal that do not destroy the landscape. We must also develop ways to deep mine coal that protect the health and safety of miners. Until we achieve these breakthroughs, we should avoid measures that could seriously weaken the coal industry and lessen coal production. In particular, amendment 612(b) to S. 425, the strip mining legislation that recently passed the Senate would prohibit surface mining of federally owned coal where the United States does not own the surface rights, thus effectively preventing development of 63 percent of our low-sulfur western coals.

We have talked for years about the development of our oil shale. We have an estimated 1 trillion 800 billion barrels of oil shale resources in the United States, and just those reserves that we presently know are exploitable could satisfy our needs for oil for decades. The problem is that we need further research and development that will yield techniques to extract this oil in environmentally sound ways. What we need is an increased effort toward the development of this potentially productive resource.

I am especially encouraged by recent progress in the in situ processes for extracting shale oil.

We also have to push forward in the development and utilization of nuclear power. The administration will soon submit legislation to expedite the licensing and construction of nuclear powerplants which are an essential part of our program for achieving energy self-sufficiency.—

There have been many problems relating to the construction of energy facilities, and we are going to submit expanded legislation in this area shortly.

We have also talked for years about development of such relatively distant alternatives to fossil fuels as fusion and geothermal and solar energy. These alternatives are still very much in the R. & D. stage of growth and they could not come into widespread use until after 1990. Although we have to invest in the development of these alternatives, our primary focus now must be on nearer term measures for

expanding energy supplies. We must focus heavily on coal and oil shale. Also, we must concentrate on commercial development, and not just long-term research.

All of this will require a significant commitment of both private and Government resources.

Further, we cannot concentrate solely on expanding our energy sources. Over 30 percent of our energy is wasted in one way or another, wasted in conversion from one form to another, wasted in transmission, and wasted in unnecessary usage. As a part of our long-term program for self-sufficiency, we must establish a permanent conservation ethic and mount a major attack on waste. Over the long term, conservation of energy will require investment in insulation of homes and offices, use of more efficient automobiles, development of mass transit, changes in methods of handling freight, et cetera.

In the meantime, we are asking the American people to make temporary sacrifices, to drive less and to keep their homes cooler in winter and warmer in summer. We have found an encouraging response by the American people to our requests.

In New England, for instance, consumption of heating oil by homes has been 16 percent below normal in December after adjusting for degree days.

In order to assist the American people in knowing how much energy various products require to operate, we will submit legislation requiring all major appliances and automobiles produced or imported into the United States be clearly labeled to indicate their energy use and efficiency.

#### ENERGY TRUST FUND

The energy trust fund proposed by this bill offers one approach in a national effort to achieve the ability of self-sufficiency in energy. Such a fund could help to assist in the commercial application of new sources of energy and a major investment program in energy conservation. In connection with the administration's proposal for an emergency windfall profits tax, we suggest the possibility of an energy development bank to accelerate the pace of technological change and capital investment to provide new energy supplies.

However, there are problems inherent in the creation of any broad scale trust fund, for priorities do change and maximum flexibility is always desired. Still there is no question that a massive commitment to the development of energy resources is needed—a commitment comparable to the synthetic rubber experience in World War II or the Manhattan project—and I welcome the opportunity to discuss this approach, as well as others, with you.

#### TAX ON ENERGY SOURCES

Section 202 of the bill would impose a British thermal unit tax on the extraction of oil, gas, and coal and on the production of electricity. We have to consider carefully the merits of such a proposal and I would like to point out some of the problems.

The apparent purpose of the tax is to raise revenue for the energy trust fund. Your staff estimates that the tax would produce revenues averaging \$5 billion a year over the next 10 years. However, it is

important to point out that such a tax would cause an initial price increase of approximately 5 percent in the case of oil and in the neighborhood of 13 percent in the case of the less expensive grades of coal. These major amounts would have significant impacts on the relative uses of different fuels and would generally be passed on to consumers. Moreover, during the period when imported oil is more costly than domestic oil, the proposed tax would weigh more heavily on domestic oil.

There is some appeal to the thought that those presently using energy should pay for the cost of the energy research. However, the beneficiaries of this R. & D. will be future generations and not present consumers, and any benefits will be diffused among the population as a whole.

Further, certain energy users should not be taxed at all. For example, we should not levy a tax on a taxpayer who generates electricity from solar power. Such a taxpayer would not be taking any energy source away from any other taxpayer, and in developing and installing such a system, he would doubtless have already paid handsomely for research and development whether incurred by himself or others.

Similarly, we should not tax users of coal when we are, in fact, trying to promote use of that fuel in preference to other fuels. A tax on British thermal units would typically represent a greater percentage increase in the price of coal than in the price of oil, thus discouraging the very thing it is hoped to promote.

Finally, the \$5 billion a year revenues from such a tax are very large. In fact, they are equal to about 2 percent of the total revenues presently collected by the Federal Government. Although energy R. & D. is extraordinarily important, and we should see that it is adequately funded, we must not be wasteful. Like any other Government activities, the R. & D. operation should be subject to the normal budgetary discipline of choosing which expenditures are worthwhile and which are not.

#### TERMINATION OF PRICE CONTROLS ON NATURAL GAS, OIL, AND OIL PRODUCTS

The bill also provides for deregulation of new natural gas and a gradual phasing out of price controls on petroleum and petroleum products. Further, it provides for termination of price controls on steel products used by the energy industry.

Natural gas is an ideal fuel. Its combustion causes virtually no pollution. There is minimal loss in transit, and it is relatively easy to clean and store. Unfortunately, control of the wellhead price of natural gas, imposed after the *Phillips* decision in 1954, has been very damaging to our Nation's welfare. Drilling for new gas has fallen steadily since peaking in 1961. Production has declined since 1970. Yet, we have trillions of cubic feet of gas both onshore and offshore which remain unutilized. Here we have a good example of well-meaning Government intervention having undermined what was once a healthy industry.

Natural gas is seriously underpriced. New natural gas, controlled by the FPC, now sells at a price of about 45 cents. If you converted, on a British thermal unit basis, an amount of new natural gas equivalent to a barrel of imported crude, the gas would sell for about \$2.70.

A barrel of imported crude oil now sells under contract for about \$9. Is there any wonder why investors have been discouraged from drilling for new natural gas?

It is important to emphasize that if the price of new gas were decontrolled, it would not mean a sharp increase in the price paid by the consumers. New gas would account for only a small proportion of all natural gas produced each year. It would take 5 to 10 years before the consumer felt any substantial impact from the price increases. Additionally, it is important to note that the wellhead price constitutes only a small fraction of the price paid by the homeowner in most areas. The bulk of the rate charged is for transmission and distribution expenses, which should not increase as a result of wellhead deregulation. The deregulation of new natural gas prices is urgent and we support it. We also support a provision authorizing the Federal Power Commission to establish limits on absolute price increases.

With respect to the decontrol of petroleum prices, I am concerned that decontrol within 1 year could result in a very substantial price increase. I would favor a provision decontrolling petroleum prices after several years. The President should have the discretion to advance this time schedule if conditions warrant it. It will take at least 3 years to build the refineries and pipelines and to produce the crude oil necessary to increase supply significantly. Nevertheless, any decontrol of petroleum should be structured in such a way as to provide incentives to industry expansion while, at the same time, avoiding excessive prices and profits at the expense of the consumer.

With respect to deregulation of products used by energy industries, there is no question that we are faced with a general shortage of steel for many of the same reasons that we are faced with a general shortage of energy. Again, any decontrol must be structured carefully and the Cost of Living Council is carefully considering this issue.

#### WINDFALL PROFITS TAX

At the same time that we need to encourage the development of our domestic energy resources, we must not allow the petroleum industry to profit at the expense of the consumer. To be sure of that, we proposed the emergency windfall profits tax on December 19, 1973. In lieu of the tax proposed in section 601, I strongly urge the committee's consideration of the administration proposal.

The emergency windfall profits tax is designed to deal effectively with the problems which exist; it is coordinated with a total energy program; and it is workable.

I am concerned that the tax proposal in section 601 is focused on an elusive concept of excessive profits rather than the real culprit, excessive crude oil prices. Profits, we all know, can be up or down because of the level of revenues and the level of expenditures. We want to encourage energy producing expenditures, but not wasteful expenditures aimed at keeping taxes down. Prior excess profits tax laws did encourage wasteful and inefficient expenditures.

I am even more concerned that the tax proposal in section 601 will be a very real economic as well as psychological barrier to much needed increases in energy producing investments. A 40-percent excise tax, which does not phase out or have a time limit, on top of a 48-percent corporate income tax rate would be enough to discourage any investor.

The credit for qualifying reinvestment goes a long way, to be sure, toward reducing that discouragement, but the rules for how to get credit for the qualifying reinvestment and when the credit has to be given back have to be so complex to be workable and fair that they will have a substantial deterrent effect on increased investment in energy producing facilities. And if additional investments to produce additional supplies are not forthcoming, oil prices can only escalate further as consumers bid up the prices for the existing supplies.

Furthermore, our experts in the field of tax law administration believe that the proposal would be very complicated to administer because it requires an allocation of income and expenses of taxpayers between energy items and nonenergy items. In the case of many taxpayers, this allocation would be very complicated. Taxpayers would find it difficult to comply with the law and the Government would find it difficult to enforce the law.

The administration's emergency windfall profits tax proposal would provide a much more satisfactory solution to the problem of high crude oil prices since it focuses directly on the problem by taking away the windfall part of the price increase in crude.

It phases out over the period during which energy supplies will be increased, thus not discouraging the needed new investment to obtain additional supplies.

It falls on the producer, not the consumer, since it merely takes away unexpected profit rather than adds costs which must decrease expected profit or be passed on.

It is simple to administer. It involves no complex calculations, no complex returns, and no complex concept.

At this critical time we must be sure that any solution devised for windfall profits does not work at cross purposes with the goal to achieve independence from foreign supplies. The emergency windfall profits tax is consistent with our goals.

#### FOREIGN DEPLETION ALLOWANCES

In addition to the need for a windfall profits tax, we must review carefully our policy with respect to the tax treatment of foreign operations. U.S. companies that produce oil overseas have been granted the same 22 percent depletion allowance abroad that is granted to U.S. companies producing oil in the United States. Both allowances provide an incentive for oil production. As we move toward U.S. self-sufficiency in energy, however, we want to encourage greater development of U.S. energy resources rather than foreign resources. Therefore, the President has asked the Congress to eliminate these foreign depletion allowances, while retaining the depletion allowance for domestic oil production.

However, we cannot support the provision calling for repeal of intangible drilling allowances. Unlike percentage depletion, intangible drilling costs are real costs—the money has actually been spent—and a deduction should be allowed at some point. It is not really a question of total disallowance but of when the tax is imposed.

To some extent, what we do with intangible drilling expenses for U.S. purposes makes little difference for foreign production, for the same reason that depletion is largely irrelevant on foreign production,

namely, because foreign governments can be expected to tax at a level sufficient to absorb the full U.S. tax.

Nevertheless, there are some situations where abuses are possible and in April of last year, the administration made proposals, which are carefully tailored to such problems and I would urge that such an approach be considered by the committee.

Further, although not specifically addressed in this bill, it is important to point out that a very large portion of the amounts which are paid by international oil companies to the countries in which they produce are designated as income taxes and therefore give rise not to a deduction but rather to a credit against their U.S. taxes.

We think this subject needs to be addressed in view of the changing world conditions. The total amounts of these payments have grown so large that it appears unrealistic to continue to treat them entirely as a tax. Obviously, however, the oil producing countries, like any other country, have the right to impose taxes and some reasonable portion of the payment should be treated as a creditable tax. We are working on legislative proposals which would cause a part of these amounts to be designated as tax and the balance to be designated as deductible payments.

Sections 901 and 902 double the investment credit from 7 to 14 percent on plant and equipment invested in energy facilities and extend the credit to intangible drilling costs, secondary and tertiary recovery costs, and geological and geophysical expenses up to \$50,000 per well.

We proposed, last April, an exploratory drilling tax credit structured to reward success by offering a higher credit for a productive well. In part, such a credit was devised because of the high degree of risk involved in exploration.

At this point, we would not recommend the expansion of such a credit beyond exploratory activities where no extraordinary risk factors are present. As to the plant and equipment, I believe the 7-percent level pertaining to industry generally is adequate, but I would welcome any special evidence you may have suggesting a different conclusion.

#### RESIDENTIAL ENERGY CONSERVATION

The proposed tax credit for residential energy conservation expenditures poses many problems. Almost any home improvement could be designed to include energy conservation features and, therefore, become eligible for the 50-percent credit.

There is a high risk of abuse of this provision and its benefits would go mostly to the middle and upper income homeownership group. We therefore would oppose this provision as both difficult to administer and inequitable.

#### CONTROL ON IMPORTS

Section 701 provides for duties on petroleum and petroleum products imports to the extent that the average domestic price exceeds the price of the import for that month. This provision would be inoperative today because virtually all petroleum imports are more expensive than domestic production.

In the future, however, it might become necessary to assure the investors in domestic resource development that the government

would not allow future domestic prices to be undercut by foreign oil, which because of its lower costs of production, could be sold at reduced prices.

While the purpose of this provision is commendable, if it proves to be necessary, the same result could be achieved under the license fee system of our existing mandatory oil import program without raising many of the basic trade policy and tariff negotiation problems that would be inherent in tariff legislation.

Insofar as providing necessary assurances to encourage investment, an alternative approach may be a governmental price guarantee to those willing to undertake commercial development of new technology.

Moreover, the bill's proposed restrictions on imports from particular Arab countries are not desirable. We are determined to move rapidly toward self-sufficiency in energy and this will ultimately mean a reduction in our dependence on oil from the Arab countries. However, an outright legislative restriction on future Arab imports would work against both our long-range goal of building a stable relationship with the Arab producers as well as the shorter term objective of expanding Arab production so that United States and world demand is met.

If we legislate a 5 percent limit on Arab imports within the United States now, we will in effect mandate continued shortages, with all the attendant economic consequences, since over the next 3 to 5 years, U.S. oil demand can only be met by expanding Arab oil imports beyond the 5 percent limit.

#### NEGOTIATIONS WITH OIL-IMPORTING COUNTRIES AND RELAXATION OF IMPORT CONTROLS

President Nixon has invited other major oil-consuming nations to come to Washington on February 11 for the purpose of explaining those actions which might be taken to stabilize the world oil situation. This conference will lead to a meeting of both oil-consuming and oil-producing nations. The present Arab embargo has highlighted for us all the interdependence of oil-consuming and producing countries. We must seek to avoid an aura of confrontation or coercion among or between consumers and producers. To this end, legislation which would appear to threaten those nations that did not abide by the U.S. viewpoint might be misinterpreted and could lead to a rejection of the diplomatic initiatives already undertaken. I would recommend the deletion of section 704.

#### EXPORT CONTROLS

We already have authority under the Export Administration Act to limit exports of any product which would adversely affect the national security. This legislation, therefore, is not necessary because it gives us authority which we already have.

We have looked closely at monitoring of oil exports through the export licensing system administered by the Department of Commerce. Our total level of oil exports is about 235,000 barrels per day. This represents less than two-tenths of one percent of our total petroleum consumption. Moreover, most of these exports are shipped to countries from which we import larger amounts of petroleum and petroleum products. Further exports of crude and major petroleum products amounted to about 40,000 barrels per day for the period from January

to June, 1973. To cut off our low level of exports of petroleum to other countries in the face of our dependence upon them for petroleum imports could result in a net overall reduction in our petroleum supplies. We will continue to monitor the flow of petroleum exports and will not hesitate to impose controls to limit exports to historically low levels. In the case of distillates, residual fuel oil, motor gasoline and aviation fuel, such controls are already effective.

Exports of drilling and mining equipment during the last six months were higher than during the entire fiscal year, 1973.

However, the Department of Commerce informs us that the industry is expanding and that it should soon be capable of meeting both our domestic and foreign requirements.

A cutoff of exports means not only reduced employment, but also the possible loss of future markets for American industry. For this reason, I would hesitate to take any action that would encourage or force other nations to develop this capability. Restricting exports of mining and drilling equipment should be a last resort. I do not feel therefore, that title VIII is necessary and urge that it also be chopped from the legislation.

#### INCREASED PRODUCTION OF ENERGY FROM FEDERAL LANDS

We have asked repeatedly that Congress open up Naval Petroleum Reserves No. 1. We are faced with a major threat to our security and well-being and, for this reason, now is the time to bring these reserves into production, and an administration bill for this purpose, has passed the Senate. I hope the House will act on this promptly.

The Elk Hills reserve is able to produce 100,000 barrels per day within 60 days and 160,000 barrels per day within 90 days, and to maintain a level of production of nearly 300,000 barrels per day over a 5-year period. If opened to the public, this source of crude could help alleviate oil shortages on the west coast.

Naval Petroleum Reserve No. 4, in Alaska, is virtually unexplored and Senate Joint Resolution 176 would provide this. The potential of this reserve is enormous. However, the Navy estimates that adequate exploration to prove the amount of oil in this reserve would require about 10 years and would cost \$200 million.

The oil lost to the Government from opening up Elk Hills could be replaced in an emergency by the Government's royalty oil. Production of this royalty oil has been averaging about 220,000 barrels per day. It would have the advantage of being readily available, rather than potentially available as is the oil from our existing NPR.

#### COMMISSION ON ENERGY TECHNOLOGY ASSESSMENT

The provision calling for a commission on energy technology assessment has much to recommend it. However, there appears to be considerable duplication between this commission and the Energy Research and Development Administration which we hope will be established in the very near future. We expect that both the Federal Energy Administration and the Energy Research and Development Administration will conduct the kind of studies and provide the in-depth reports that are contemplated by the provisions of Title IV. The establishment of a third group, we think, represents needless duplication in a field already crowded with over-lapping bureaucracies.



## ESTABLISHMENT OF THE FEDERAL ENERGY ADMINISTRATION

Finally, as I said, there is need for a permanent organization to coordinate energy policy and implementation. The FEA is a needed first step and gives us needed authority to do the job before us. We must also press for the creation of a full cabinet-level Department of Energy and Natural Resources.

In conclusion, I would say that this bill is a comprehensive legislative approach to many of our energy problems. It should set the framework for needed discussion. I believe that we all share common goals with respect to energy policy. We all want a strong domestic energy industry, and I hope that we can work closely with your committee in developing legislation that will further this goal. It is only through such cooperation that we can move our Nation toward self-sufficiency.

Thank you, Mr. Chairman.

[The following tables were submitted by Mr. Simon:]

## EXPORTS BY PRODUCT TYPE

	Barrels	Barrels per day
Crude oil .....	133,007	735
Unfinished oils .....	9,369	52
Average gas .....	37,764	209
Gasoline .....	464,984	2,569
Kerosene .....	522,602	2,887
Distillate .....	609,068	3,365
Residual fuel oil .....	5,200,333	28,731
Lubricating oils .....	4,634,718	25,606
Miscellaneous nonfuel, nonlube oils .....	3,363,178	18,521
Butane .....	295,837	1,635
Propane .....	1,833,410	10,130
Natural gas liquids .....	3,290,218	18,179
Petroleum pitch .....	281,104	1,553
Petroleum coke .....	17,328,996	95,734
Asphalt .....	138,442	765
Miscellaneous grease, waxes, and petroleum .....	4,525,000	25,000
<b>Total .....</b>	<b>42,668,085</b>	<b>235,731</b>

	Imports	Exports
Indonesia .....	186,458	
Japan .....	5,983	32,940
Malaysia .....	12,238	
Singapore .....	12,188	
Algeria .....	158,860	
Angola .....	32,022	
Egypt .....	16,066	327
Ghana .....	641	
Libya .....	175,131	
Nigeria .....	437,498	
Tunisia .....	19,226	
Australia .....	1,320	2,076
Chad .....	6	
South Africa .....	11	
Philippines .....	94	
Fr P Islands .....		577
India .....		934
Other .....		23,621
U.S. territories .....		
Hawaii, FTZ .....	3,668	
Puerto Rico .....	99,866	
Virgin Islands .....	332,455	
<b>Total .....</b>	<b>6,004,253</b>	<b>210,731</b>
Miscellaneous products (not elsewhere classified) .....		25,000
<b>Total .....</b>		<b>235,731</b>

Senator GRAVEL. Mr. Simon, that is an excellent statement and an excellent analysis of the bill, and I have gleaned some things that will cause me to change my approach in it.

But there are a couple of items that I would like to pursue with you because I think that there may be some misunderstanding as to the intent or effect of these items.

Going backwards in your statement, the last item that I would like to call your attention to is the Commission on Energy Technology Assessment. There would be a built-in redundancy, there is no question about it. But one of the problems that I think we face in Government is that Government, as much as the private sector of our society, takes a proprietary interest in an area and is capable of making mistakes from myopic vision as a result of this proprietary interest.

What we are talking about here is not a redundancy in a normal sense. What we are talking about is setting up an adversary group that will immediately cause studies to be made from an adversary point of view. I do not think that the AEC or our entire atomic energy approach would be in the trouble it is today if it had this objective assessment. It has not had it and we have had the Government, in concert with the private sector, vectoring in on one goal with nobody funded to intelligently take an adversary approach to that goal. And I think that our society is the loser when we do not permit an automatic check and balance to take place.

And to do this properly, it needs some funding and not have to rely upon the largesse of wealthy individuals, or foundations who may think it is a good idea or not a good idea. So that is the only proposal of this Commission, would be sort of be outside of Government, as critical of Government as it is of the private sector, but funded so that it can get its information.

Mr. SIMON. Well, as I said, Mr. Chairman, we found it an interesting concept, and certainly we have not a closed mind to this idea at all. But we are looking at something that potentially we feared might complicate and prolong the effort in getting at the goal of self-sufficiency.

I have always favored the adversary approach. We have this type of committee with the scientists that Guy Stevers chairs, and it is extraordinarily and very wonderfully critical of many things. I think it is a useful approach.

Senator GRAVEL. Very well, and I would just commend that for further attention because that kind of critical analysis will not take place as a matter of course because of the nature of Parkinson's law and the Peter principle of which I am sure you are familiar, with both of them.

Mr. SIMON. I am operating under it. [General laughter.]

Senator GRAVEL. You are handling it awfully well. We could well learn some lessons from you.

The other item is Petroleum Reserve No. 4. The administration—and I appreciate your stating the administration's position in this regard—supported the passage of Senate Resolution 176. As I understand it, all we have done with this resolution is put up a pittance of money to permit the Navy, of all people, to go in and do some additional minor—and I underscore minor—exploratory drilling.

You talk in terms of \$200 million over 10 years. We do not have 10 years as I see it, and I think it is ridiculous to think in terms of 10

years when the President talks of self-sufficiency within a decade. That means that we have to have something like Prudhoe Bay on line, which we will in 3 years, and Pet 4 on line within 5 years.

Thus, if it is going to take the Navy 10 years to just prove up Pet 4, we are talking about an additional 3 to 5 years to get the oil to the market. I think this is ridiculous.

I have run into this syndrome with the Navy and with the Department of Defense, and I want to go in on record with the statement I made yesterday: the only conspiracy of withholding product from the American people that I know is Petroleum Reserve No. 4. It could be leased like any other public lands. There is nothing sacrosanct about this land. There is no reason why it could not be leased in the private sector. The private sector would spend a billion dollars in a year proving and developing this property, not \$200 million over 10 years.

And I think—and I would ask your comment—that this is the first step toward socialism. Whether or not we have a man in uniform in the field doing the drilling, we have put the Navy in the oil business. There were some Navy people at the last API convention in Houston telling other oil people that they were now in the oil business, too, and asking the other oil people how to do it. I think this is ridiculous and I think it is the first step toward a federally owned oil company.

The Navy comes up here seeking budgets for a nuclear defense capability, and yet they are hoarding—hoarding is the word—hoarding our oil, oil that, if released, could lower the price of oil paid by the American consumer.

Now I know the administration is not taking an aggressive position in developing these reserves. In fact, it has been so unaggressive that it has been no position. When I hear you telling me in your statement that there is no further elaboration, I think Department of Defense still has sway at the White House with respect to satisfying the oil needs of the country. Is that a fair assumption? Or am I being unkind to the Navy and the Department of Defense?

Mr. SIMON. Well, the Department of Defense obviously has some national security problems with the proposals involved. But the administration has really, I think, been quite aggressive in recent times, in Pet 1, in utilizing the moneys from Pet 1 to prove out Pet 4.

And, as I say, we have supported it through the Senate and are pushing for it in the House—

Senator GRAVEL. Mr. Simon, that will take us 10 years or more at that rate of cash flow.

Mr. SIMON. I agree with you, it should be done quicker, Mr. Chairman.

Senator GRAVEL. Could I then address myself to the point you raised, which is a point put out by the administration on national defense, or put out by the Defense Department. We have just had a crisis. We have had an oil embargo? We have fleets in the Pacific and the Mediterranean, and in the Atlantic. Would you tell me where they got their oil during that crisis?

Mr. SIMON. It was from us. They got their allotment from—

Senator GRAVEL. It was from the American people. The whole inventory that is available to us. They got it from Gulf Oil, they got it from Exxon, they got it from Texaco—

Mr. SIMON. It was the domestic supplies.

Senator GRAVEL. Right, they got it from the domestic supplies of our companies. They got it from the companies; is that correct?

Mr. SIMON. Yes, sir.

Senator GRAVEL. Does it make any sense for the military to keep reserves and not use them during an emergency? To keep reserves that decrease the total oil stocks available to all Americans and, during a crisis, to not draw on those stocks but to commandeer oil from the stocks available to American consumers which the military has already reduced through holding reserves?

Mr. SIMON. Oh, no, we have no trouble with that, in the administration, whatsoever, as far as the opening up of Pet 1 and Pet 4. I guess we could define what "aggressive" means, and the definition of "national security."

If there is one statement that I have made hundreds of times in the past 14 months that I have been testifying on this, the term "national security" has been redefined. The energy problem has started to redefine the term "national security" from military to economic and political.

Senator GRAVEL. Well, I could only add by way of comment, because I do not think you would be in a position to confirm it, that in this crisis, during the course of our embargo, our conventional defense capability outside of the United States became dependent upon foreign governments.

This would mean that if the NATO countries, chose not to supply our fleets with oil, then our conventional capability would have been almost nothing. I think this is an unfortunate situation. This is the policy that we have been sold, the policy of self-sufficiency for defense purposes.

Mr. SIMON. The reasons that you just mentioned are illustrative of the compelling need to open it up as quickly as possible for storage, et cetera.

Senator GRAVEL. Would you not think that as we do have a track record in this country with the free enterprise system, maybe the best way to immediately develop Pet 4 would be to lease it as we do all other public lands? Lease it to the private sector? Does it have to be a bonus bid? Maybe because we know there is oil there, we could get a bigger cut for the American people. Would that not make more sense?

Mr. SIMON. I would favor that approach; yes.

Senator GRAVEL. Thank you, Mr. Simon.

On the negotiations with the oil importers, I think your statement was well taken. Probably our position is a little too harsh, but I hope that the position we take in the bill will serve as notice to foreign governments, particularly Libya, which according to this morning's papers, suggested to Japan and Western Europe that they not attend the conference called by President Nixon. I think the conference called by President Nixon is the only intelligent course of action that the free world can take to defend itself in the midst of the disruption that is taking place.

I think that if we can establish a vehicle to counsel and to negotiate with OPEC nations, we have less chance of a violent flareup as the result of this problem.

So, I take note of your statement. I do not disagree with it, but I also feel that the Libyans and the Syrians are demonstrating their

lack of understanding as to what can be achieved through negotiation rather than unilateral price gouging.

Another point is on the British thermal unit tax. I want to thank you and let you know that I deeply appreciate your espousing the concept of the need of a trust fund method. I appreciate your underscoring the inflationary impact of the tax since the cost of this tax would be carried through to the consumer.

I know of no tax that is not carried through to the consumer. In fact, if people who are in business do not carry through to the consumer, they do not stay in business. That is one of the immutable laws of economics. To stay in business you must make a profit.

We have to assume that the tax would be carried through. I think that the point you raised is a sound one, that is, should we pay as we go? Does that have a lesser inflationary impact than deferring through some device, and I do not know what that device is, deferring payment to some future time so that those who enjoy the benefits from R. & D. will also carry the burden of payment?

I do not understand how that would take place in the future, but I am sure that your team could come up with a concept to do it. But I cannot help but feel that since we are the generation, together with prior generations, that have been wasteful, it is not too much to ask us to pay as you go to correct that wastefulness. We have to recognize that.

Pay-as-you-go will also have a dampening effect on consumption, which in the eyes of many environmentalists is a virtuous and desirable activity. It would be a legitimate dampening. We have heard comment that we ought to have a tax to cause people not to consume so much. And, in addition, if we say, let us have a tax that pays for what we are going to do, intelligently and as we go, I think in point of fact that it will not add to inflation but will help control inflation. If we do not, we will see aberrations in our economy where we might, for a few months or a year, not contribute to inflation, but really play into the hands of disastrous inflation by not paying as you go.

I think the best example of that was the Vietnam war, when we thought that victory could be surgically accomplished in a short period of time, and then the costs sort of silted in and hung on us like a plague. And, of course, it is a cause of a great deal of our economic woes today.

I would like to request, Mr. Simon, that you relook at the possibility of a carry through, of some way we could defer this cost for the R. & D.

Mr. SIMON. I think, Mr. Chairman, you make strong, good arguments on the first point as far as the British thermal unit tax is concerned. You have to look at what is tax equity, or fairness, as far as the people who are paying it. And, in one sense, all taxes eventually do get passed on through to the consumer. But there is no doubt that the British thermal unit tax would be passed on immediately and it would have some reduction of demand effect.

But another way to obtain revenues for a fund, or whatever vehicle is put into place, is the windfall profits tax. The incidence of this tax is producer-oriented, rather than consumer-oriented.

Senator GRAVEL. Could I interrupt you, sir?

The problem I have with the windfall profits tax is that we have a dual purpose. We want to get capital, not only into the hands of the public sector through the trust fund, but also into the hands of the

private sector so that they can pay their share of the capital cost of making us energy self-sufficient. If you take money from the private sector of our energy industry and put it in the public sector, you will indeed pay for the public activity, and the American people will not be faced with an increase in tax, but then where is the money going to come from for the private sector? The additional money will have to come through increased prices. Then, again, the consumer will pay.

So, would it not, from an accounting point of view, be better to rectify the accounts and say here is what it costs to do that, let us pay it straight out and look at it. And here is what it costs in the private sector to raise the capital, let us look at that, and pay that.

Mr. SIMON. One option for Congress to consider, which was mentioned in the windfall profits tax proposal, was to give full or partial tax rebates for qualifying reinvestment, and that could be used for R. & D. for future development.

Senator GRAVEL. For the private sector or the public sector?

Mr. SIMON. For the private sector.

Senator GRAVEL. Right. Then you have to come back to the British thermal unit tax for the public sector. You cannot have your cake and eat it too. If you are going to spend that money once in the private sector, fine. But you cannot spend it in the private sector and the public sector both.

Mr. SIMON. You could also use general revenues, or a combination of general revenues and the windfall profits tax.

Senator GRAVEL. Well, I agree with that.

Mr. SIMON. Let us make the commitment. The important thing, I think in this whole dialog, is to make the commitment now that would guarantee self-sufficiency in this country. We have all seen too many times where something that has a great sense of urgency in this country today, that 2 years from now, or maybe even 6 months from now, we are going to be arguing about the next crisis. And in the process--the appropriations process, et cetera, which I happen to believe in, the disciplines of appropriations in this country, we are indeed in danger looking down the road of not matching the goal of self-sufficiency and forgetting some of the important lessons we are learning today.

So, Mr. Chairman, I agree with you in structuring this vehicle. Let us get the job done in the fairest possible way.

Senator GRAVEL. Mr. Simon, I unfortunately must absent myself. As you recall, yesterday Mr. Mondale said he was going to offer in the Democratic caucus a resolution to roll back prices. I do not think that would be in the best interests of the energy problems facing the American people.

I want to go do battle on that issue right now in the caucus and I will leave you with my distinguished colleague, Senator Dole.

I again want to say that I think we are blessed to have a person of your talent to help carry us through the crisis. I think the American people are sophisticated enough to see the benefits of your activities and will come to realize it costs money to do things; and that people who promise to do something for nothing, usually give them nothing.

Thank you, Mr. Simon.

Mr. SIMON. Thank you, Mr. Chairman.

Senator DOLE (presiding). Well, Mr. Simon, I will not take much of your time. But rather than talk about Senator Gravel's bill, which

I think has great merit—which you have discussed, I think, quite well—I want to take just a few minutes to at least raise some questions that can be answered very briefly.

I held about 50 public meetings in Kansas during the congressional recess, and one question I was asked at almost every stop, as you have been asked many times, is how can there be an energy crisis today if we were in a full-scale war in Southeast Asia 2 years ago? That is part one.

And second, if we, in fact, have such a crisis, what has this done to us insofar as our defense posture is concerned? In the event of an emergency or conflict would we be prepared to engage in such a conflict?

I ask the question to at least pose the questions that are on the minds of a great many Americans, millions of Americans who are not yet convinced that there is an energy crisis because of conflicting reports coming from Congress and the executive. Perhaps what you say on the record might be helpful in this area.

Mr. SIMON. Well, of course 2 years ago, Senator Dole, we did not have the embargo. Let us remember in the background my comments here that many people have been reminding the American people for many years, especially in the last few years, of the probable consequences of increases in petroleum demands of 4 to 5 percent in this country each year for the past 40 years. At the same time our production was peaking, and our exploration peaked 18 years ago.

With this background, foreign governments embargoed oil exports to us from the Mideast. Some people argued about the effectiveness of such an embargo. They said that oil was a fundible, tradeable, barterable commodity, and could not be effectively embargoed.

But the embargo has worked extraordinarily well, with a lag—there is a lag because there is a lot of oil in the pipeline. For the last 2 weeks, our petroleum situation has been right on target with the reductions we expected in imports from the Arab nations, the European refineries and the refineries in the Carribean whose source of crude was the Mideast.

There has been great suspicion in this country that no shortage actually exists. It is difficult to explain our supply situation because of the complexities of the industry and the lack of verification, if you will, as far as the inventory data of the companies.

The source of the inventory data is the oil industry, as I explained yesterday, but that is not surprising since we get all our data for any industry in this country from the industry itself. From the outset, I explained that even an approximate 3 million barrel a day reduction in oil supplies in this country that would normally consume 18 million barrels a day (and in the wintertime upward of 19) was a manageable shortage. We waste an extraordinary amount of energy in this country and if we would just be a little more thoughtful, we could save those 3 million barrels and not change our lifestyles that terribly much, by conservation methods.

In the fourth quarter of 1973, we had the effect of the embargo gradually taking its bite. We had some leakage in the embargo also. We had great conservation on the part of the American people. And we had a good break in the weather.

The result of all this was to raise the level of inventory, so we were able to go into the first quarter of 1974 with larger inventories. And

this has enabled us to draw down inventories faster than we would have if the inventories had been at a lower level.

When the oil companies reported their inventories were up, for the reasons just mentioned, everybody said, see, there was no shortage. Well, I will guarantee you, Senator, that if this embargo continued another 6 or 9 months, the experiences that are being felt in New York City and in Oregon, in Arizona, and the other spot shortages—because shortages do not occur evenly in this country due to our complicated distribution systems—the bite of the shortage would begin to be felt.

Traditionally, the oil industry has kept about 40 to 45 days of inventory.

Now you know, did you ever stop to think how expensive carrying that inventory is? Especially when you compare interest rates of 10 percent or higher to carry inventory with normal margins of profit? It is prohibitive really to carry terribly much more than that. I would think, running a business as they do, that they would keep the minimum amount of inventory on hand that would allow for the contingencies of bad weather and increased demand and seasonal demand, et cetera.

The inventories fluctuate from higher gasoline as they build it up in the winter to meet spring and summer demand, to lower gasoline when they switch over to the heating oil as the winter season approaches, to heat the homes in America. This is just commonsense economics of running a business.

For a dramatic illustration, maybe we needed to have our total supply cut off from around the world, which satisfied 38 percent of demand, just preembargo. Maybe that would have brought home to the American people that regardless of whether we have got 45 or 50 days of inventory in this country, a real shortage exists.

And the shortage is clearly illustrated in the fact that we would normally consume 18½ to 19 million barrels a day in the wintertime—that is what our demand would have been this year—and we only produce, in this country, 11 million barrels a day. Well, the balance of it has to come from some place, and it comes from these foreign countries—Venezuela, Canada, the Mideast. All of our incremental demand over the next 4 or 5 years, until additional production comes on line, and our demand is estimated to increase at 4 to 5 percent per year, is going to come from the Mideast nations.

This does two things. It subjects us to a cutoff in the middle or end of this decade when, if our demands continue to increase as they have in the past, we will be importing 50 percent of our consumption with consequent economic damage. Now just think about the pricing side of the equation which has been so dramatically illustrated since the OPEC nations announced the increase in posted price in December.

We are going to spend, this year, in the area of \$20 to \$22 billion for our foreign supplies. Now can we continue to afford to do this? We can afford it better than any other nation in the world because we import less than obviously the lesser developed nations and Japan. This represents a true shortage.

What we cannot produce here that we yet demand we must pay foreign nations for. This is very simple to me, but we have to just keep repeating it and repeating it. Is it a good idea for us to continue to send \$20 billion to \$25 billion per annum to foreign nations for oil,



when we could spend much less than that to develop our domestic oil and our domestic alternate supply sources. With our super abundance of natural resources that we have been blessed with and technology in this country, we could keep that money here at home as a spur to our domestic economy.

I have probably talked too long, Senator, but I get exercised on that subject.

Senator DOLE. I am going to send that answer out to a lot of people.

Mr. SIMON. I used to think that I could articulate, but I have lost confidence in myself on this subject.

Senator DOLE. I think it is a very serious question when we ask the American people to sacrifice. They have heard so many conflicting reports—some based on conviction, some based on political expediency—I assume, that they have grave doubts.

You indicated that the embargo now is almost totally effective. Is there any hint of an early relaxation of the embargo?

I note the same stories that everyone notes about Libya and their feelings about continuing the embargo, but is there any evidence that there might be some relaxation soon?

Mr. SIMON. I just go completely on what Secretary Kissinger has said since he arrived home from the Mideast the other day. But the suspicions of the American people, unfortunately are fueled by many, many irresponsible and unknowledgeable comments on the part of many people. If they looked beyond their nose they would find the facts. Before they started talking about tankers coming off shore, they should have investigated as we have investigated the tanker activity and what indeed is being imported into this country. You know, the Customs Department does charge a fee for all oil that comes in this country, and the Customs Department in the Department of the Treasury—well, I will not give you my prejudices on the Treasury Department, but they do an extraordinarily professional job. Imports are monitored—customs collected and thus we have a daily check, an instant monitoring system, on ships and imports in this country. We know what is coming in and out. Our customs reports give us hard numbers, not assumptions. To have a plane fly over and take a picture of a bunch of tankers that are in New York Harbor, which is one of the busiest ports if not the busiest in the world is not a responsible investigation of the facts. I would assume there would be tankers coming in and out of there all day. As some people have observed, the draft on some of these tankers in the picture is rather high. I just think that was terribly irresponsible investigation, and especially people in high places with responsibility ought to investigate some of these things before they make these charges.

I have a responsibility. I also have an accountability. My accountability is to you, Senator, and to the American people as a member of this Government. A lot of these people think they have a responsibility, but unfortunately they have no accountability.

Senator DOLE. Well, the question of tankers was raised and also in my State the question I think in my State was raised about a \$100 million or \$300 million loan to Algeria for a pipeline for liquified natural gas. When we talk about our self-sufficiency policy and project independence, it is difficult for me to respond to that question. Maybe it was made with total justification.

Of course, the Eximbank has its own policies on loans, but it is hard for the average consumer to understand that if we really have all of this problem, that we are supplying other countries with money to increase their fuel availability.

Mr. SIMON. We have a great deal to do with Eximbank policy and loans in the Treasury Department, and obviously there are many reasons why the Export-Import Bank would give credits. The credits are a spur to exports, which are very important as far as the balance of payments and the strength of the dollar are concerned. The credits permit construction of American ships to bring fuel, such as LNG, tons, from Algeria. This guarantees us an alternate energy source, if you will, just as the Russian deals will if they become economic. It does not overly concentrate all of our needs, our future needs in one area at reasonable prices. And John Nassikas, who obviously must have approved the pricing on that deal can expand on it when he arrives.

Senator DOLE. He has arrived. In fact, he will be there in a minute.

For the record, it might be helpful to have documentation on the major oil companies, or oil companies—I do not know how you define major from minor, but oil companies—expenditures over the last 5 years for the production of oil in the Mideast as compared to production in this country. The obvious question is whether the oil policy in this country is made by the major oil companies.

I am not suggesting that is the case, but it is a question raised, and perhaps this information would be helpful.\*

Mr. SIMON. One might also say that the Congress writes the tax laws, and other laws providing these economic incentives and disincentives. Let's go back to the 1950's when exploration peaked, when they could drill a well at relatively shallow depths, and it cost anywhere from \$50,000 to \$75,000 to get a fairly productive well. Exploration was cheap, and that was fine.

And then as they began to find all of the easy oil and gas in this country, they had to add secondary and tertiary recovery methods which were more expensive. They began to drill deeper wells and explore the Outer Continental Shelf and the North Slope, which obviously were going to produce much more expensive oil. So, the oil industry did what anybody else would have done. They went abroad where the oil was shallow and plentiful and cheap to produce. That is the primary reason they went abroad, but they were spurred by many other disincentives that I mentioned in my testimony at another time.

Senator DOLE. I share your views with reference to depletion allowance for foreign oil producers and also that we should not eliminate the intangible drilling costs. But I think there are areas where Congress—and we are, of course—should be addressing our tax policies generally with reference to the oil and gas industry.

I will ask Mr. Nassikas later about the effect on deregulating natural gas prices on the consumer. I think you spelled it out very clearly in your statement that there would be a period of 5 or 10 years over which gas prices might rise and that you are not convinced that it is going to mean a skyrocketing price in a short time. In fact, you do not believe it would happen.

\*At presstime, Mar. 28, 1974, the information referred to had not been received from the Federal Energy Office.

Mr. SIMON. No, because transmission, distribution and other expenses obviously are not going to go up because you deregulate natural gas prices. But one thing was not in my statement which will be in it the next time I give it, tomorrow, and that is the interstate-intrastate natural gas sale problem. In the natural gas producing States today, contracts are being written at 65 or 80 cents, prices per M ft<sup>3</sup>; and in one recent case, a long-term contract was signed at \$1.25 for intrastate sales. Now what is the incentive for interstate sales to supply New England or other areas with regulated prices per M ft<sup>3</sup> 25 or 30 cents? I think that is a ridiculous situation.

If this situation continues, there will be continued curtailments of service, and all of the new supply is going to be kept in the State where it is produced. It will be priced there so that people will treasure it as a natural resource, as we have never done before in this country, instead of wasting it and burning it under boilers, which is ridiculous.

Senator DOLE. I do not recall the network, but there was a rather good piece on television with reference to intrastate and interstate in Texas just about 10 days ago. It indicated that the price had risen to 90 cents for intrastate sales. I do not know what it was interstate, perhaps 30 cents. This does, of course, raise a fundamental question in gas producing States like Kansas, for example. Should we be anxious for interstate shipments under the current price structure when we can also keep the fuel in our own States.

Mr. SIMON. That was the "Today Show" and I hope it helped convince Frank McGee on that program about the problems of natural gas.

Senator DOLE. I do not say this in any partisan sense because this is not a partisan issue—but right now, somewhere in the Capitol, the Democrats are meeting on rollbacks. And to be quite candid, I have an amendment drafted myself which would roll back the price of propane. I have been in my State, and I understand the politics of a rollback, or at least of lower prices. It would be quite popular if we could reduce the price of gasoline and diesel. The truckers are demanding a rollback too.

Propane prices in Kansas have tripled. If the rollback is not an effective remedy—and I think it is your position that it would be, maybe not only ineffective, but disastrous—what hope do we have for the consumer except to tell him that gas has not gone up as much as milk?

Mr. SIMON. Senator, we are working right now, and will have within a reasonable period of time, hopefully within the next week, new price regulations on propane. In the past year we have seen sharp curtailments of natural gas supplied to industry. Faced with these curtailments, some industry and others have sought alternate fuels. Some of them have turned to propane, which was already in short supply. Seventy percent of our propane comes from natural gas, and with natural gas, as I say, in short supply, the consequences of having additional propane users have been predictable.

As I say, we are working in the price area on price regulation. As you know, a price regulation would not bring on any additional supply, but we do not want the consumer needlessly gouged by higher prices.

Senator DOLE. With reference to a rollback, generally, as far as every fuel commodity is concerned, I understand you do not feel that is a solution to the problem we have now.

Mr. SIMON. Have we not learned that controlling anything in this free enterprise economy is apt to cause other problems. We can go back to our food experience last year and we can go back to our natural gas experience, starting in 1954. This is an industry that requires tremendous investment. We should—and I say this again and again—make sure that there are only reasonable prices allowed to be charged. During a period of tremendous imbalance between supply and demand, with the cartel that is functioning, we cannot allow our domestic price to rise to unreasonable, emotional levels, but we have to make sure that the price is at a level that is consistent with inducing additional investment to bring on the additional supplies we need in this country.

Anything else that we do to discourage investment is just going to mean higher and higher import bills to foreign nations.

Senator DOLE. Do you think we have about reached a peak as far as gasoline prices are concerned?

Mr. SIMON. I cannot judge what the OPEC nations will do so far as their price is concerned, although I have stated several times that I think their next price adjustment should be downward. But I think that we have seen the explosion so far as fuel prices are concerned in this country.

Senator DOLE. Thank you, Mr. Simon. I have no further questions.

If you would submit the information for the record on the expenditures, past 5 years, it would be useful.

Mr. SIMON. Yes, sir. Thank you, Senator.<sup>1</sup>

Senator DOLE. Thank you.

(A table submitted by FEO, a draft of an FEO paper entitled "United States Energy Self-Sufficiency: An Assessment of Technology Potential," and Mr. Simon's answers to questions submitted by Senator Hartke, follows. Hearing continues on page 1185.)

SERVICE STATION PRICES,<sup>1</sup> EXCLUDING TAXES—AVERAGE, 55 REPRESENTATIVE U.S. CITIES

[Cents per gallon for regular grade gasoline]

	1969	1970	1971	1972	1973	1974
January.....	23.49	23.95	25.61	25.12	25.31	32.85
February.....	23.30	22.88	25.39	25.53	24.81	36.07
March.....	24.25	23.74	24.10	23.33	25.94	.....
April.....	24.38	25.62	23.83	23.85	26.32	.....
May.....	24.15	24.84	23.43	22.85	26.49	.....
June.....	24.47	24.89	24.79	23.60	26.78	.....
July.....	24.20	25.62	25.39	24.04	26.82	.....
August.....	23.48	23.81	26.75	23.51	26.81	.....
September.....	23.99	24.49	26.38	26.12	26.74	.....
October.....	23.23	24.60	26.62	25.43	27.69	.....
November.....	23.32	23.71	24.35	25.01	28.56	.....
December.....	23.90	26.50	25.71	25.17	30.30	.....

<sup>1</sup> At beginning of month.

Source: Platt's Oilgram.

<sup>1</sup> See footnote, p. 1116.

**FEDERAL ENERGY OFFICE**

**OFFICE OF THE ASSISTANT ADMINISTRATOR FOR  
ECONOMIC & DATA ANALYSIS & STRATEGIC PLANNING**

**United States Energy Self-Sufficiency:  
An Assessment of Technological Potential**

**DRAFT**

**February 6, 1974**



Acknowledgments

This report was prepared by the Project Independence -- 1980 Task Force; the Cochairmen for this task force are James A. West and David O. Wood. Walter G. Dupree was project coordinator and, with John S. Corsentino and David O. Wood, compiled the summary report. Those preparing individual segments of the background papers were:

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## I. Introduction

In a nationwide address on November 25, 1973, concerning national energy policy, President Nixon established a national goal of energy "self-sufficiency" by the end of this decade as follows:

Let me conclude by restating our overall objective. It can be summed up in one word that best characterizes this Nation and its essential nature. That word is "independence". From its beginning 200 years ago, throughout its history, America has made great sacrifices of blood and also of treasure to achieve and maintain its independence. In the last third of this century, our independence will depend on maintaining and achieving self-sufficiency in energy.

What I have called Project Independence -- 1980 is a series of plans and goals set to insure that by the end of this decade Americans will not have to rely on any source of energy beyond our own.

This paper summarizes a technological assessment of U.S. energy production and conservation possibilities to achieve this energy self-sufficiency within the decade. This is only the first step in formulating and implementing a national energy policy to achieve self-sufficiency.

The principal results of the investigation to date are:

- A program of maximum energy resource development and conservation will reduce reliance on foreign supplies of petroleum to 4.4 million barrels per day in 1980. By 1980, potential non-Arab imports are estimated to be 6.8 million barrels per day, with 3.8 million barrels from the Caribbean and South America.
- By 1985, reliance upon all foreign petroleum supplies can be reduced to 1.5 million barrels per day.

- The estimates of capital expenditures required to support an accelerated energy resource development range from \$190 to \$255 billion (constant 1973 \$) by 1980.
- Our estimates of the petroleum deficit may be further reduced if even greater substitution of other fuels, especially coal, is assumed.

## II. Summary of Principal Results

The project results are presented in eighteen working papers identified in Appendix B. The detailed quantitative estimates of potential energy resource demand and supply under the development and conservation scenarios considered are presented in Tables 3 - 29, Appendix A. These estimates are summarized in Table A, page 3. Estimates of capital expenditures required by 1980 in support of the alternative development programs are summarized in Table B, page 4.

Estimates of potential energy conservation and resource development have been developed using three basic scenarios involving differing assumptions about the environment for energy production and utilization. All these scenarios are intended to be consistent with approximately the same level of real output (GNP), although the distribution will vary between scenarios. The scenarios developed include:

- **Baseline:** Pre-embargo policies, with heavy future reliance on foreign petroleum supplies.
- **Intermediate:** Accelerated development of energy resources and conservation policies.

TABLE A -- U.S. ENERGY SELF-SUFFICIENCY -- 1980:  
AN ASSESSMENT OF TECHNOLOGICAL POTENTIAL

	Summary of Preliminary Results Scenario											
	Base			Intermediate			High			Mixed		
	Pot. Demand	Pot. Supply	Pot. 4/ Dom. Deficit	Pot. Demand	Pot. Supply	Pot. 4/ Dom. Deficit	Pot. Demand	Pot. Supply	Pot. 4/ Dom. Deficit	Pot. Demand	Pot. Supply	Pot. 7/ Foreign Supply Deficit
Petroleum Products 1/ Million Barrels/Day	21.5	11.4	-10.1	20.1	12.2	-7.9	18.6	14.2	-4.4	18.6	14.2	6.8
Quadrillion BTUs	43.5	23.1	-20.5	40.7	24.7	-16.0	37.7	28.5	-9.2	37.7	28.5	13.8
Gaseous Fuels	25.6	19.5	-6.1	23.9	20.8	-3.1	23.2	23.6	-	23.2	23.6	2.8
Trillion Cubic Feet	26.3	20.1	-6.3	24.6	21.5	-3.1	23.9	24.3	-	23.9	24.3	2.9
Coal 2/ Million Tons	740	740	-	726	876	-	697	1,023	-	697	1,023	-
Quadrillion BTUs	18.0	18.0	-	17.6	21.3	-	16.9	24.9	-	16.9	24.9	-
Nuclear Power	651	651	-	651	692	-	651	757	-	651	757	-
Billion Kwhr	6.9	6.9	-	6.9	7.4	-	6.9	8.1	-	6.9	8.1	-
Quadrillion BTUs	3.3	3.3	-	3.3	3.6	-	3.3	4.5	-	3.3	4.5	-
Other 3/ Quadrillion BTUs	98.1	71.3	-	93.1	78.4	-	88.8	90.2	-	88.8	90.2	16.7
TOTAL												

1/ Includes shale oil, crude petroleum, and natural gas liquids from lower 48 and Alaska.

2/ Includes demand and production for exports.

3/ Includes hydropower, geothermal, and solar. Hydropower is constant at 2,970 trillion BTUs.

4/ A dash indicates there is sufficient supply to meet projected consumption.

5/ Includes high scenario levels of energy conservation and energy demand curtailment.

6/ From high scenario potential domestic supply.

7/ Non-Arab, i.e., Canada, Caribbean, South America, Iran, and Southeast Asia; and includes crude oil and petroleum products, and Canadian natural gas.

Table B -Estimated possible domestic energy producing capacity additions and cumulative capital costs from 1973 to 1980 <sup>1/</sup>

Energy Sources-Primary	Capacity Additions		Units	Capital Costs (Millions of dollars)	
	Base	Intermediate		Base	Intermediate-High
Petroleum					
Productive capacity <sup>2/</sup>	175	372	Million bbl/yr.	102,000	136,000
Refining capacity-----	2,400	1,000	Million bbl/yr.	8,540	2,700
Coal					
Productive capacity-----	375	542	Million tons/yr.	5,250	7,588
Railroad capacity-----	20.5	41.5	1,000 cars	3/ 676	3/ 1,660
Natural Gas-----	-3.42	-2.10	Trillion cu.ft.	(included in petroleum)	
Geothermal-----	1.5	3.7	Gigawatts	600	1,400
Solar-----	-	-	Trillion Btu	-	-
Nuclear Power <sup>4/</sup> -----	109	116	Gigawatts	43,600	46,520
Hydropower-----	11.4	11.4	Gigawatts	3,430	3,430
Oil shale-----	18	110	Million bbl/yr.	180	1,080
Energy Sources-Secondary					
Coal Gasification-----	.08	.248	Trillion cu.ft.	400	1,200
Coal Liquefaction-----	-	-	Million tons/yr.	-	-
Fossil Fuel-fired Plants <sup>4/</sup>	117	132	Gigawatts	26,700	38,010

<sup>1/</sup> Nonadditive, as not all of the capacities shown are necessary for total energy mix.  
<sup>2/</sup> Refers to capacity above base year of 1973. Does not take into consideration additional capacity necessary to offset abandonments of old fields. Capital costs includes costs necessary to keep production up to levels indicated in supporting documents.

<sup>3/</sup> Includes cost of five locomotives per 100 car train.

<sup>4/</sup> Incremental capacity. Does not take into consideration additional capacity necessary to offset retired plant.

- High: Maximum accelerated development of energy resources and conservation policies.
- Mixed Strategy: Scenario involving elements of both the intermediate- and high-effort scenarios.

The baseline supply and demand forecasts are based upon the Department of the Interior study, "U.S. Energy Through the Year 2000"<sup>1</sup>. In general, the forecast of demand was based on the correlation between economic activity and energy consumption. Figure 1 illustrates the historical correlation between Gross National Product (GNP) and gross energy consumption. Supply forecasts were based on assessments by energy commodity experts in the Bureau of Mines.

These estimates have not been adjusted to reflect the effects of the embargo on the new policy direction of energy self-sufficiency. They are, however, useful in indicating the magnitude of the transformation problems implied by the new international environment and a national policy of eventual energy self-sufficiency.

The intermediate scenario estimates are based upon assumptions of an accelerated energy resource development and demand conservation program well within the limits of technological feasibility. In particular, the supply estimates are intended to reflect the maximum attainable without introducing speculative elements into the analysis, or requiring

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<sup>1</sup>Dupree, Walter G. and James A. West, "U.S. Energy Through the Year 2000", Department of the Interior, December, 1972. Basic assumptions for the forecast are detailed there.

extreme changes in national policy. The demand conservation estimates are also intended to be well within technological limits. Overall, the demand estimates are consistent with a 15% reduction in energy demand from the year 2000 energy reference demand employed by the Office of Energy Conservation, Federal Energy Office.

The high-scenario estimates are consistent with a maximum development program including all reasonable possibilities and assuming effective policy to eliminate resource availability and capital development constraints. Insofar as possible, these estimates represent a development program constrained only by technological considerations. The demand estimates are consistent with a reduction of 30% from the Office of Energy Conservation's year 2000 reference value.

The mixed strategy scenario involves the high-scenario resource availability and conservation assumptions combined with the import assumption of the intermediate scenario assumptions. Thus, the demand would be the same as the high scenario.

Historical data for the 1948-72 period, and the forecasts of consumption for all cases, are illustrated in Figure 2.

Demand for energy for the period 1972-80 increases at the rate of 3.9% per year in the base scenario, 3.2% per year for the intermediate scenario, and 2.6% per year for the high scenario. Thus, the maximum conservation attainable for the period 1972-80 is 9.3 quadrillion BTUs, or a percentage reduction of 9.5% in 1980.

In Figure 3, we summarize estimates of total potential energy supply for the three scenarios. Total potential supply of energy resources

increases at an annual rate of 1.5% in the base scenario, 2.7% in the intermediate scenario, and 4.5% in the high scenario.

Table A summarizes the detailed estimates for each of the scenarios by major energy type for 1980. For the base scenario, demand is forecast at 98.1 quadrillion BTUs with domestic supply forecast at 71.3 quadrillion BTUs (with these figures including coal production for exports). The shortfall of production is 26.7 quadrillion BTUs. This, and the following scenarios, are graphically illustrated in Figure 3.

In the intermediate scenario, demand is forecast at 93.1 quadrillion BTUs while domestic supply is forecast at 78.4 quadrillion BTUs (with both figures including coal exports). There is an apparent shortfall of 14.4 quadrillion BTUs of energy. In the high scenario, demand is 88.7 quadrillion BTUs while potential domestic supply is 90.2 quadrillion BTUs, leaving an apparent surplus of 1.5 quadrillion BTUs.

In the mixed strategy scenario, the high-scenario demand is combined with the high-scenario potential domestic supply forecast. The result is a demand of 88.7 quadrillion BTUs and a supply, sans imports, of 90.2 quadrillion BTUs.

These apparent deficits and surpluses must be interpreted with care. In the short timeframe considered, the surpluses are not completely substitutable for gas and oil -- which are the energy sources in shortest supply.

For petroleum, the potential domestic petroleum production by source is illustrated in Figure 4, indicating the production from the

lower 48 states, Alaska, shale oil, and conservation savings. For the base scenario, more detail is shown in Figure 5. Of the total shortfall of energy production of 26.7 quadrillion BTUs, the petroleum shortfall is 20.5 quadrillion BTUs (10.1 million barrels per day). It is assumed that we have access to all foreign energy sources, including the Arabs.

Figure 6 illustrates the intermediate-scenario petroleum demand and potential domestic production. The apparent total energy shortfall of 14.4 quadrillion BTUs is an understatement of the problem. The petroleum deficit is 16.0 quadrillion BTUs (7.9 million barrels of oil per day). Total potential foreign supply (which excludes the Arabs) will only make up 13.8 quadrillion BTUs (6.8 million barrels per day). Thus, either curtailment or Arab oil must make up much of the difference if substitution of other energy sources cannot.

Figure 7 illustrates the high-scenario petroleum demand and potential domestic production. Although an apparent surplus of all energy sources exists, the petroleum deficit of 9.2 quadrillion BTUs (4.4 million barrels per day) must be made up from surpluses of the other fuels or curtailment of demand. In the limited time available, considerable doubt exists as to our ability to substitute these other fuels for petroleum; hence, consideration must be given to curtailment.

The results of the deficits for the mixed-strategy scenario would be the same as those of the high scenario. However, by allowing petroleum imports from non-Arab nations, our supply would be adequate



with only a limited (4.4 million barrels per day) dependence on foreign sources.

Figure 8 illustrates the situation with regard to gaseous fuels for all scenarios. In the base case, the gaseous fuel shortfall of 6.3 quadrillion BTUs must be made up of imports and coal and liquid hydrocarbons conversion. For the intermediate scenario, the shortfall of 3.1 quadrillion BTUs can be made up through imports (either LNG or pipeline). No problems are foreseen. The high scenario indicates a shortfall of 0.4 quadrillion BTUs. This is sufficiently low to indicate that a moderate increase in conservation or conversion effort would suffice to bridge the shortfall. If there are no problems with the high scenario, then obviously no problems exist with the mixed-strategy scenario.

For petroleum and natural gas, there may be some bias toward larger-than-necessary deficits, i.e., the deficits are overstated to the extent that substitution possibilities exist between these fuels and those fuels in surplus.

An examination of Figures 9, 10, and 11 illustrates the fuels in surplus. For coal (Figure 9), the supply for all scenarios is in excess of base demand -- which is the highest demand. For the base case, it is assumed that supply and demand are in balance. In the intermediate case, the potential supply is 150 million tons in excess of forecast demand; and, for the high scenario, the potential supply is 326 million tons in excess of forecast demand. The mixed strategy

is the same as the high scenario. The major problem with development of our coal potentialities in the past has been an inability to secure necessary capital. This could continue to be a problem in the future unless uncertainties in the market for coal are removed.

Figure 10 illustrates the fact that nuclear power, even if sufficiently stimulated by governmental action, could furnish little more than an additional 1.1 quadrillion BTUs to the total energy requirements even under the high scenario. This inability to furnish much more than the base supply is caused by the long lead times necessary to plan and construct nuclear power plants.

No significant contribution is expected from other energy sources (geothermal, solar, and hydropower) much above that projected for the base scenario. This is illustrated in Figure 11. Even for the high scenario, the contribution above the baseline estimate is only 0.17 quadrillion BTUs, an insignificant component in the forecast.

Summarizing, for all scenarios domestic production of natural gas and petroleum will not satisfy domestic consumption even when the maximum conservation program is implemented. If, however, we can secure agreements providing reliable access to non-Arab sources, in particular Western Hemisphere sources, then it will be possible to achieve self-sufficiency without significantly affecting our national rate of growth.

The above discussions would be incomplete without considering capital costs. Table B estimates the cumulative capital costs for both the primary and secondary energy systems through 1980. The totals are

non-additive as not all the capacities shown are necessary for the total energy mix that will finally evolve. The sums of these capital costs are interesting, however, as an upper limit to capital requirements. The figures are \$191 billion, \$220 billion, and \$253 billion for the base, intermediate, and high scenarios (where the mixed-strategy scenario would be the same as the high). These are very significant capital expenditures.

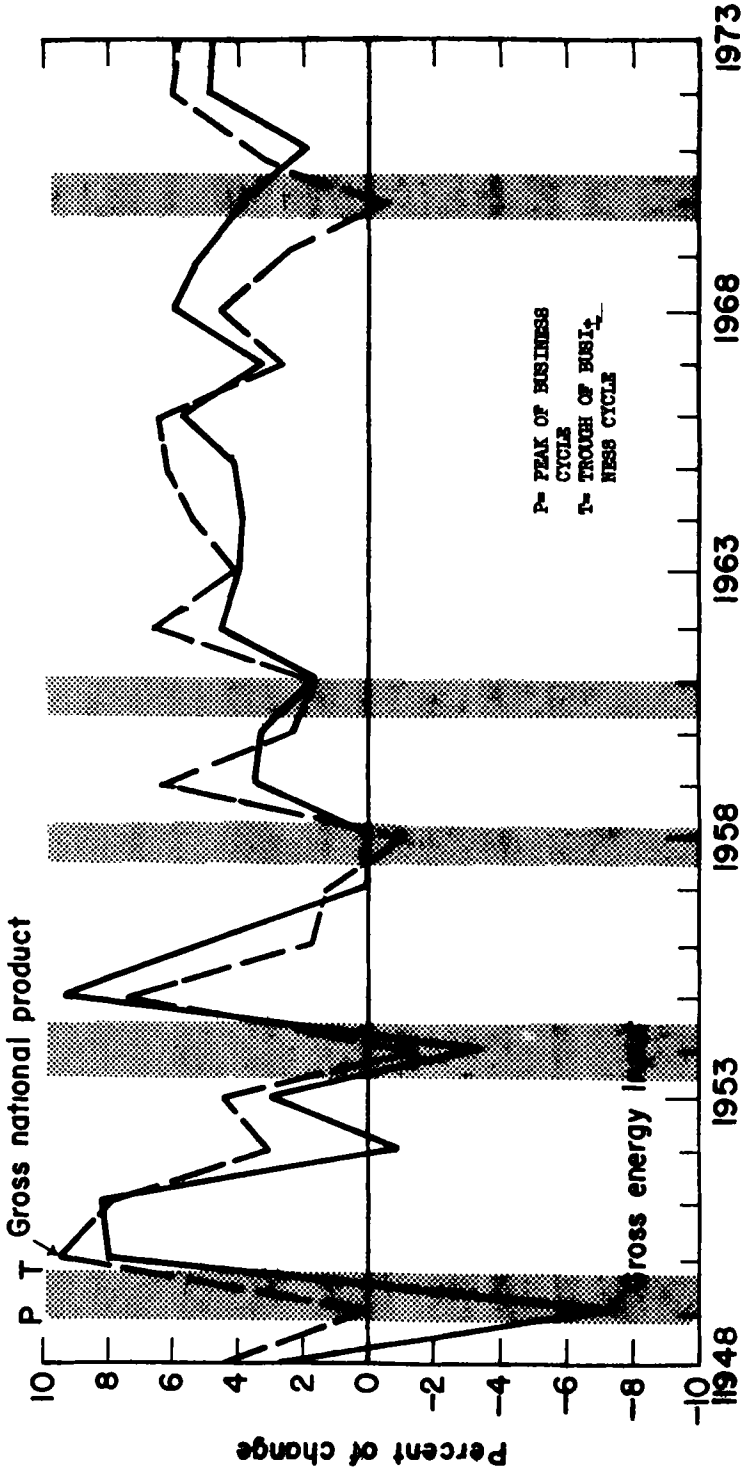
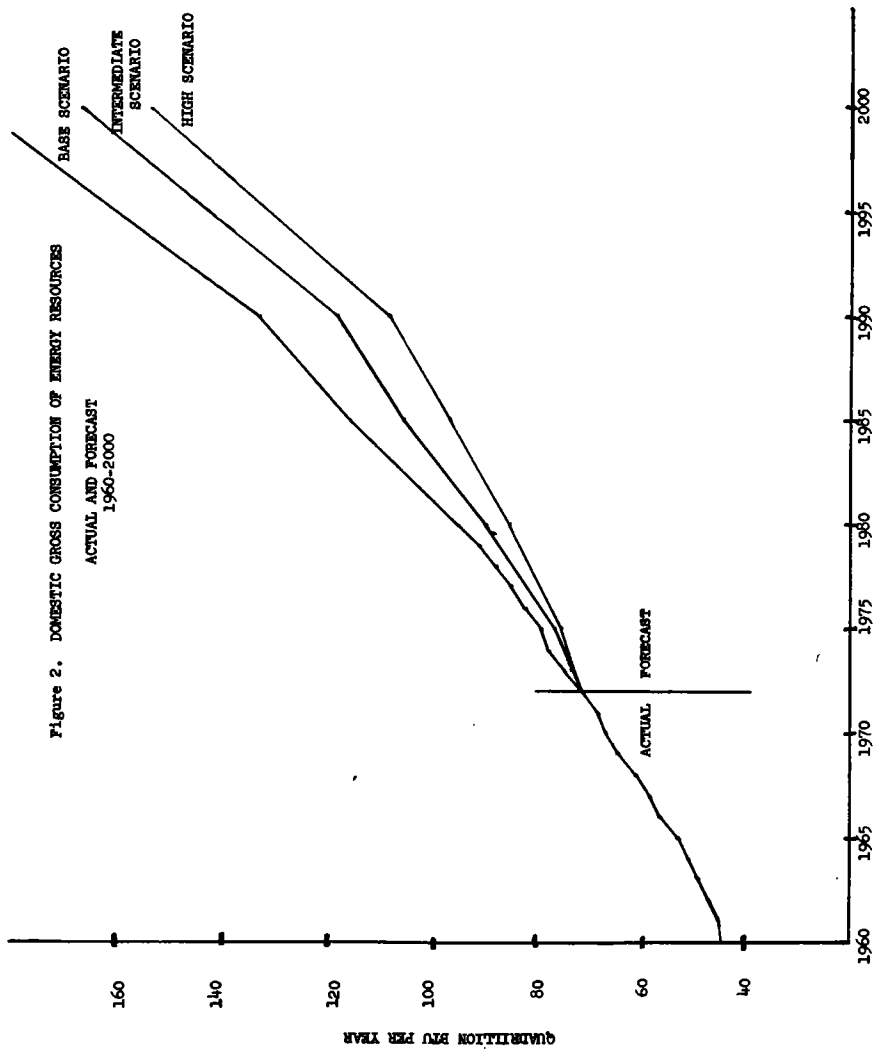
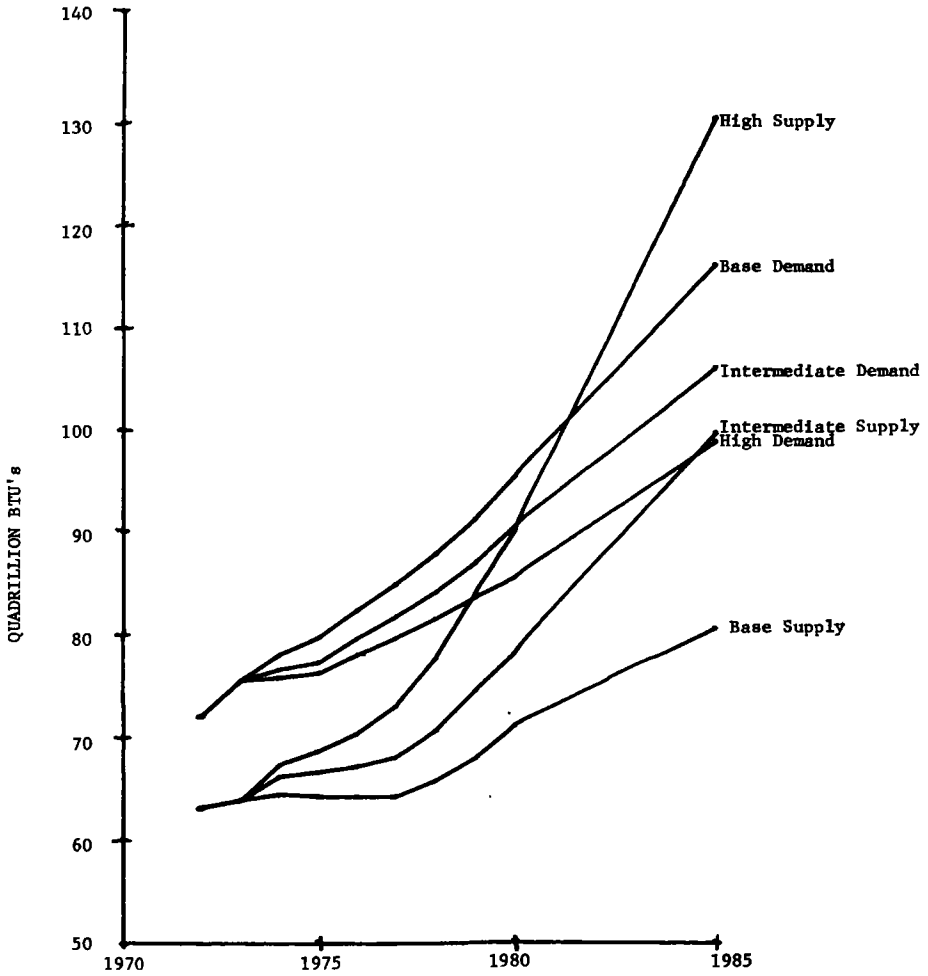


Figure 1.---- Percent Change in Gross National Product (1958 dollars) and Gross Energy Input

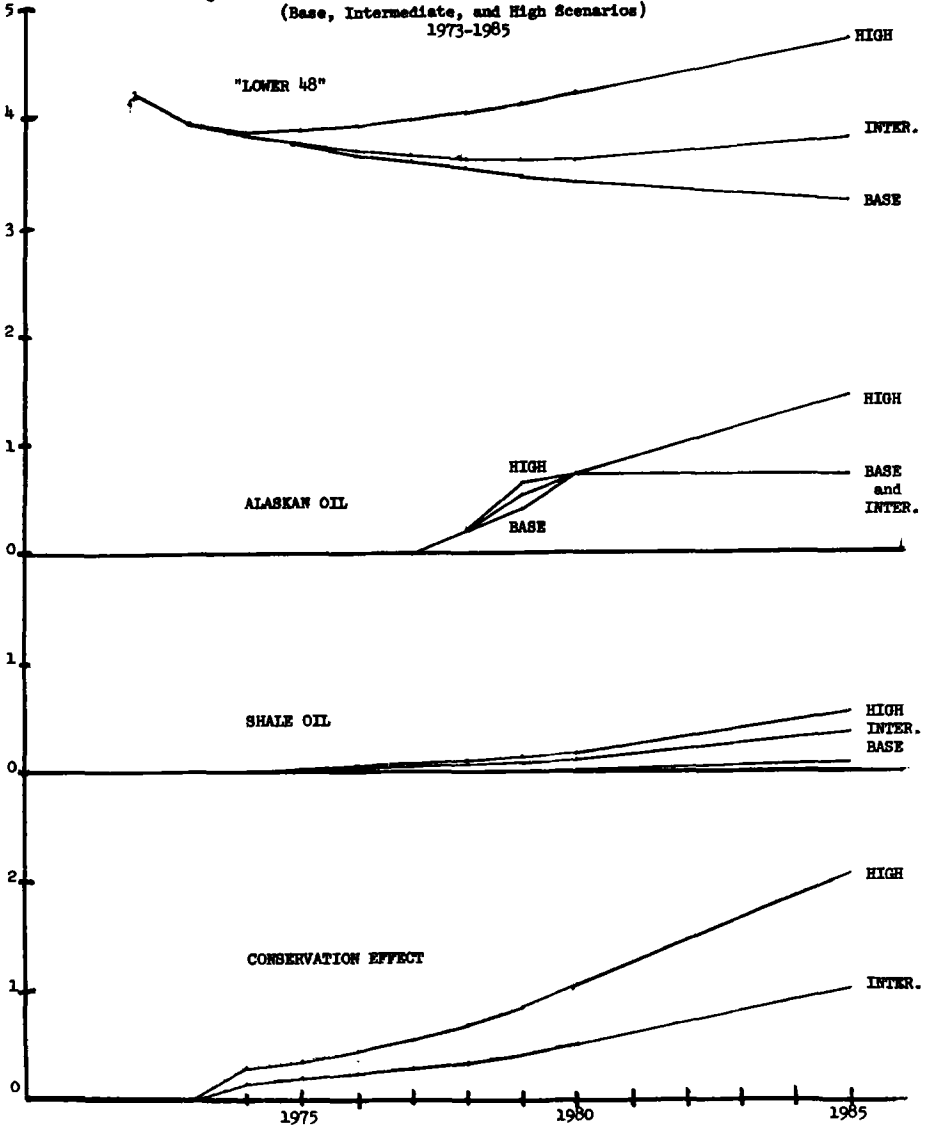


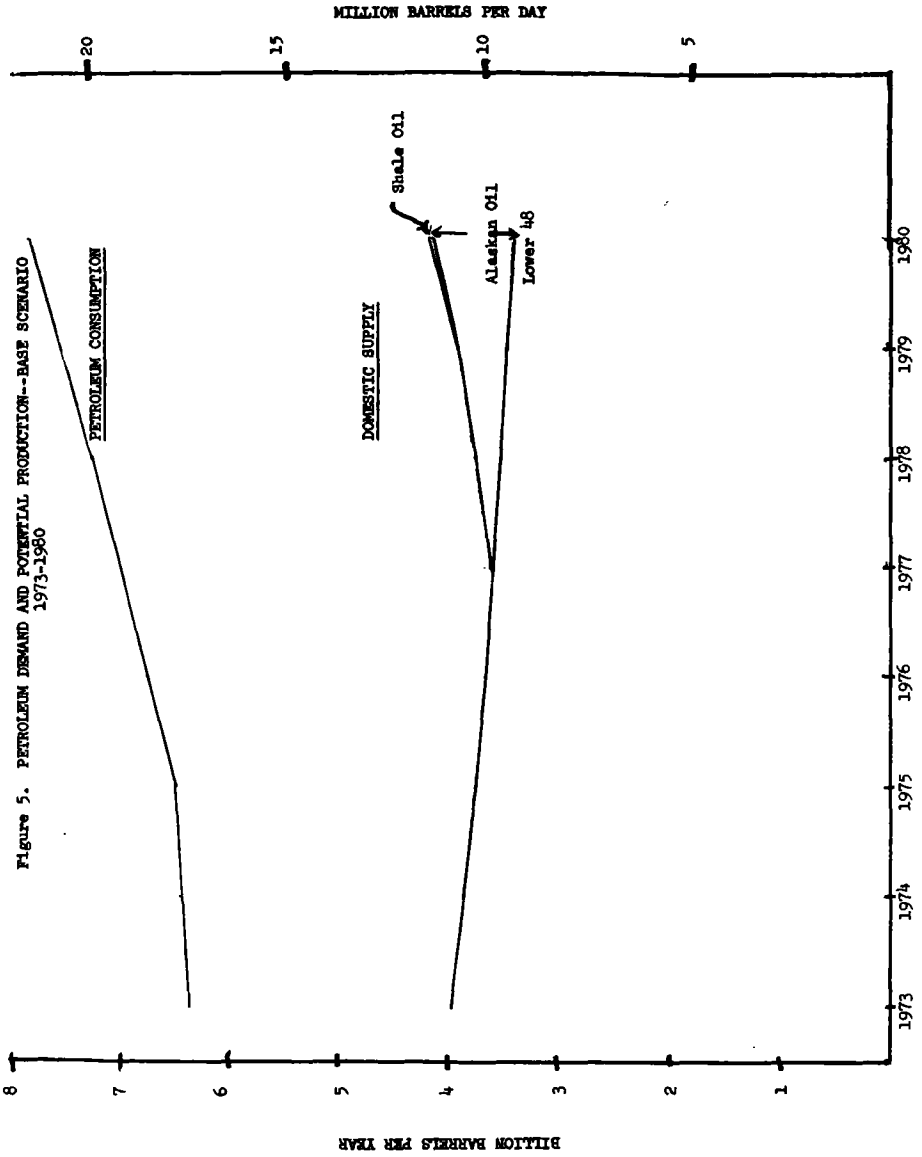
**Figure 3. UNITED STATES POTENTIAL SUPPLY AND DEMAND FOR ENERGY RESOURCES (Base, Intermediate, and High Scenarios) 1972-1985**



BILLION BARRELS  
PER YEAR

Figure 4. POTENTIAL DOMESTIC PETROLEUM PRODUCTION BY SOURCE  
(Base, Intermediate, and High Scenarios)  
1973-1985







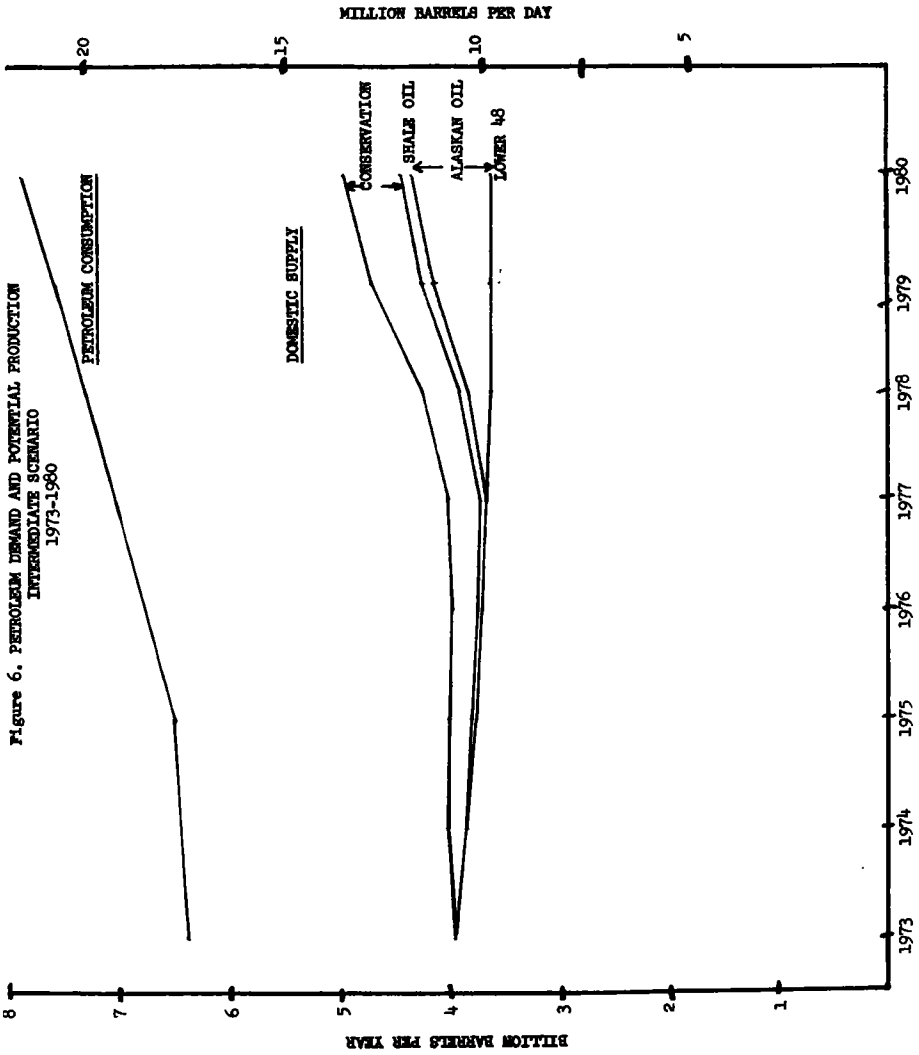


Figure 6. PETROLEUM DEMAND AND POTENTIAL PRODUCTION INTERMEDIATE SCENARIO 1973-1980

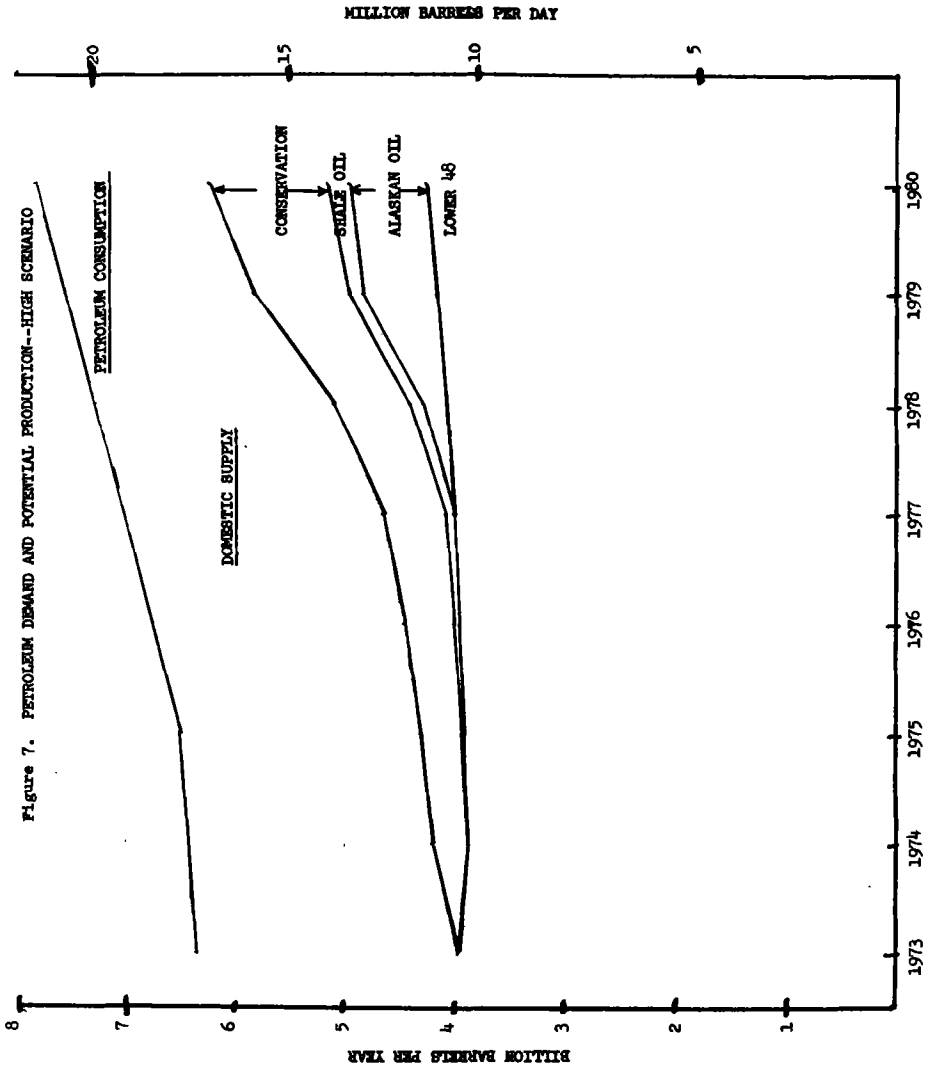
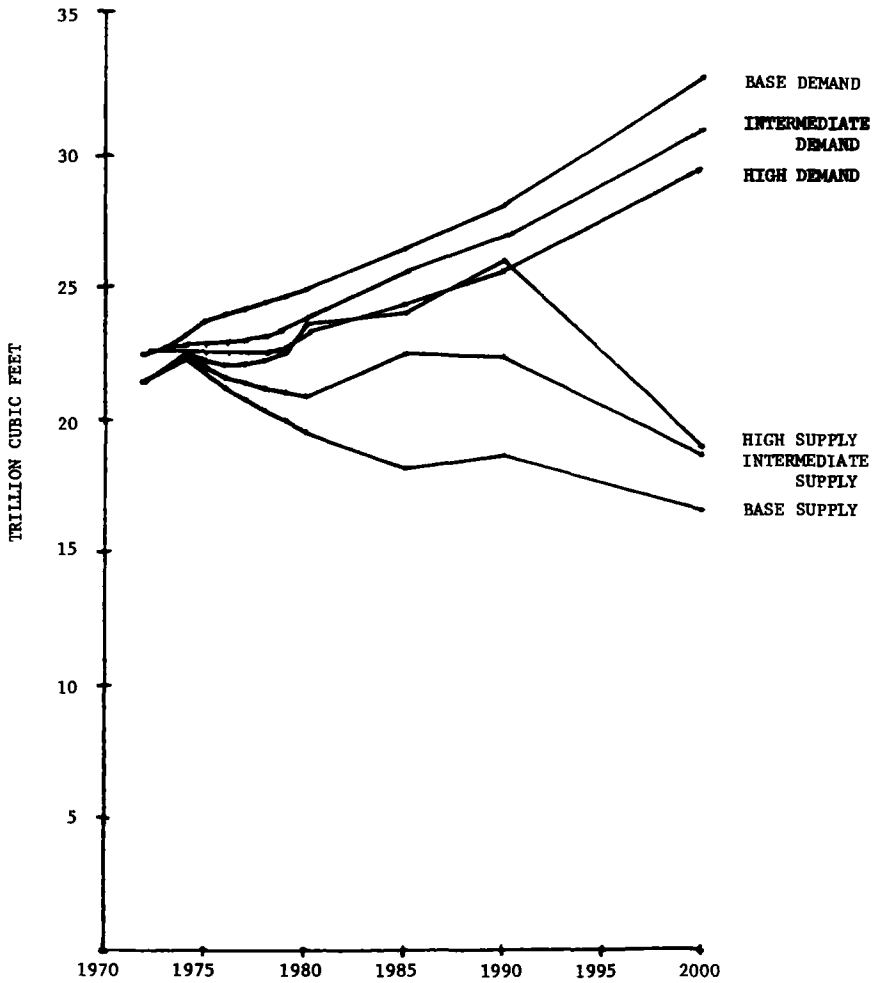
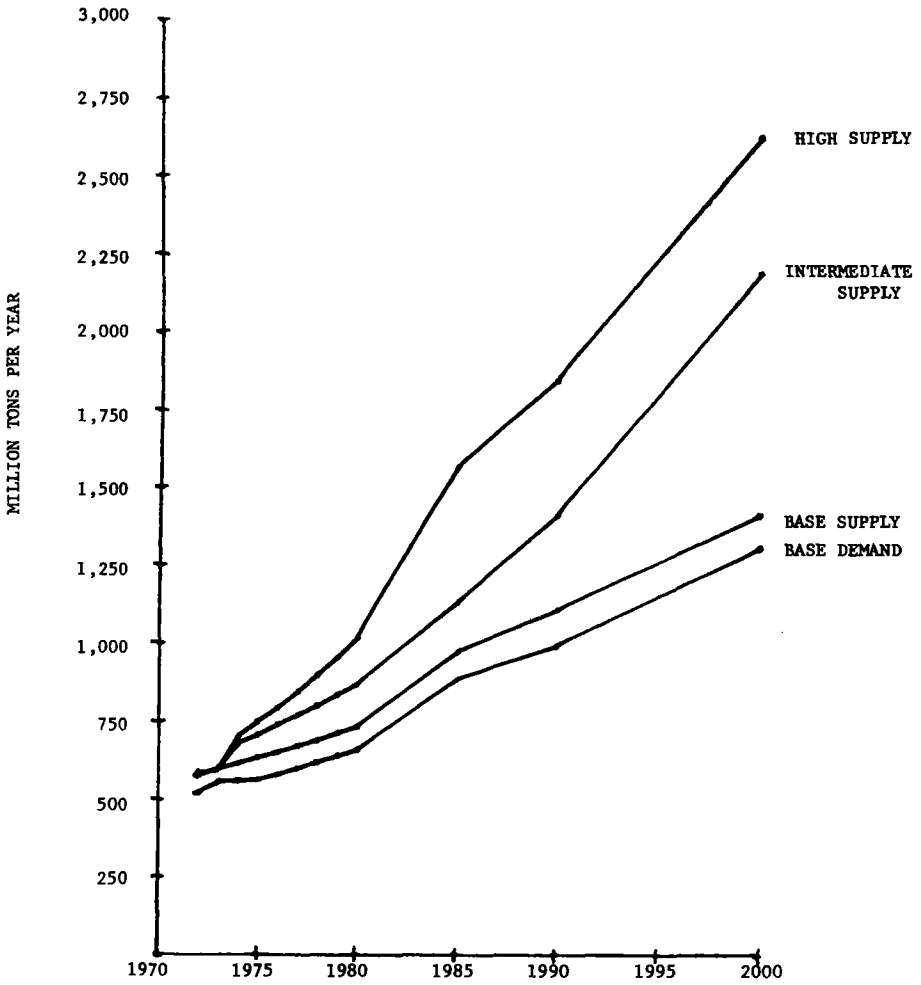


Figure 7. PETROLEUM DEMAND AND POTENTIAL PRODUCTION--HIGH SCENARIO

**Figure 8. UNITED STATES POTENTIAL GROSS DOMESTIC PRODUCTION  
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(Base, Intermediate, and High Scenarios)  
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**Figure 9. UNITED STATES POTENTIAL GROSS DOMESTIC PRODUCTION OF COAL**  
 (Base, Intermediate, and High Scenarios)  
 1972-2000



**Figure 10. UNITED STATES POTENTIAL GROSS DOMESTIC PRODUCTION  
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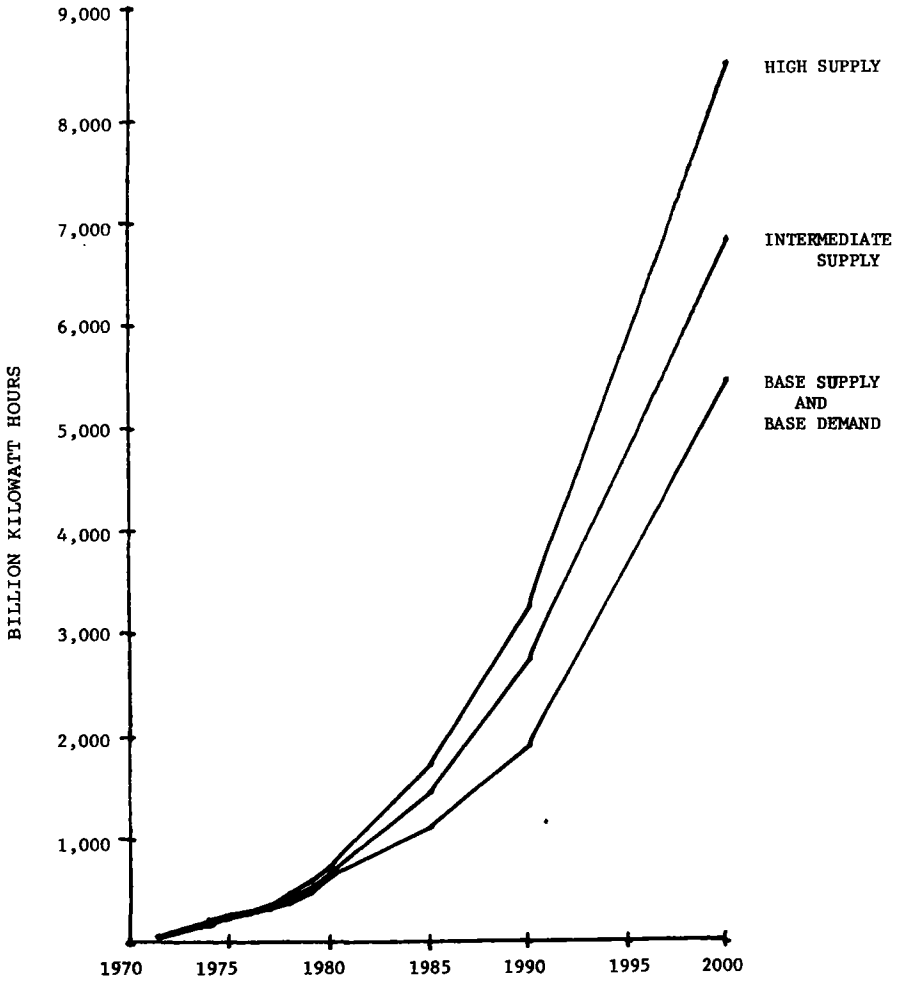


Figure 11. UNITED STATES POTENTIAL GROSS DOMESTIC PRODUCTION  
OF OTHER ENERGY RESOURCES--GEOTHERMAL, SOLAR, AND HYDROPOWER  
(Base, Intermediate, and High Scenarios)  
1972-2000

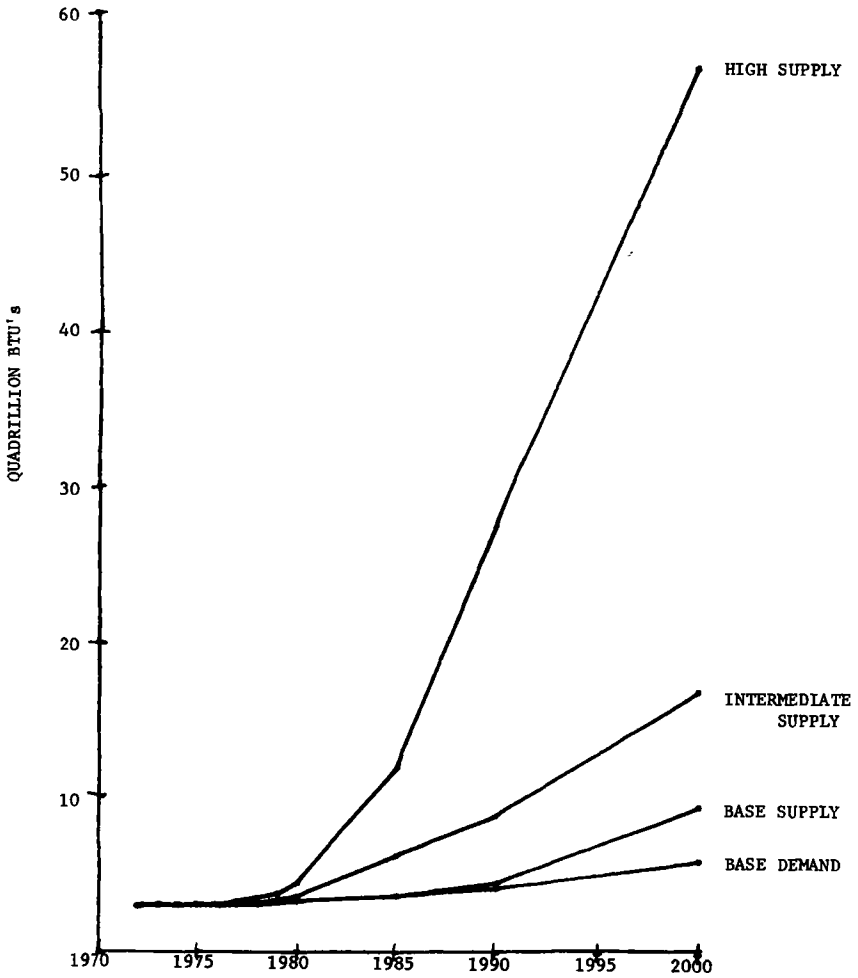
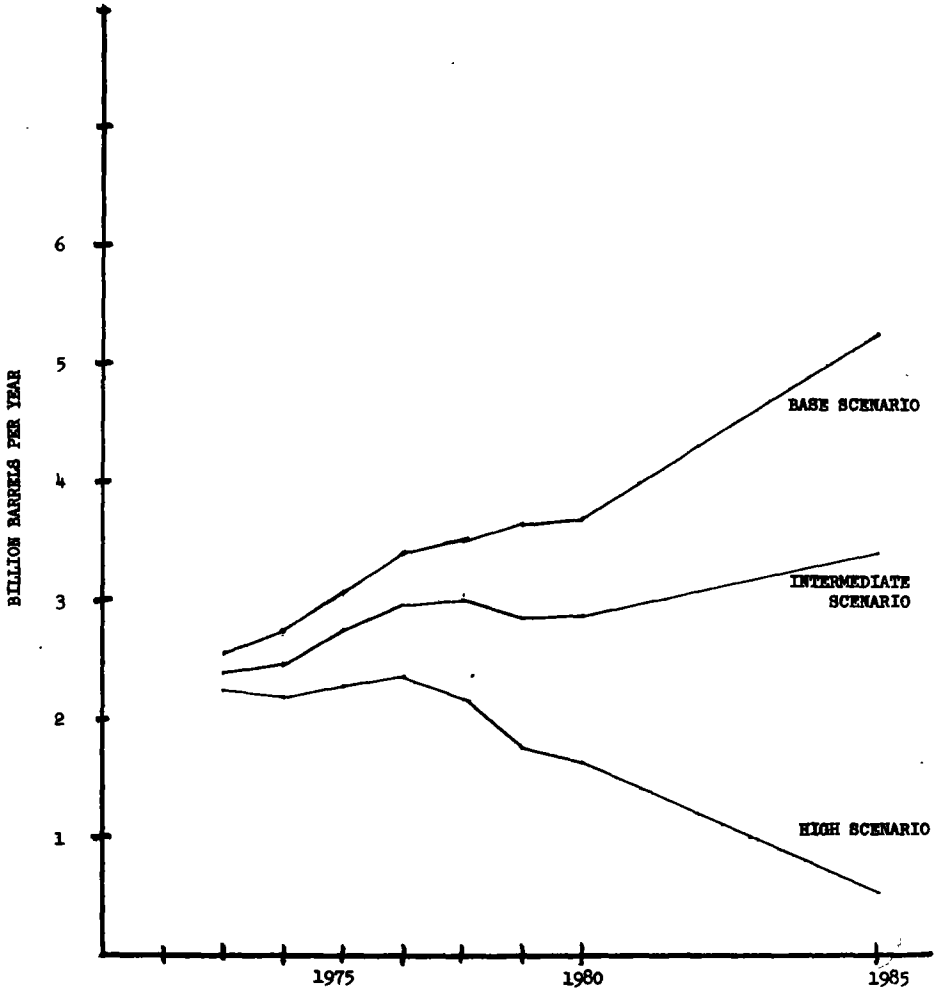


Figure 12. PETROLEUM PRODUCT DEFICITS  
IMPLIED BY BASE, INTERMEDIATE, AND HIGH SCENARIOS  
1974-1985



## APPENDIX A.

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Benchmark Projection of Gross Energy Consumption

- Table 3. - United States Total Gross Consumption of Energy Resources by Major Sources, 1972 Actual, and Projected to the Year 2000 (Base Scenario)  
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Projected Potential Domestic Production of Energy Resources; Benchmark, Intermediate, and High Development Scenarios

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Table 28. - Mixed Strategy Scenario - Petroleum Surpluses & Deficits, 1974-2000.

Table 29. - Mixed Strategy Scenario - Gaseous Fuels Surpluses & Deficits, 1974-2000

Table 1.- Selected United States Economic and Energy Indicators  
(1947-1972)

Year	Gross energy input/ (Quadrillion Btu)	Net energy input/ (Quadrillion Btu)	Population (Millions)	Gross National Product (Billion of \$ 1958)	Energy/GNP (1000's of Btu)	Gross energy/capita (Millions of Btu)	Net energy/capita (Millions of Btu)	Conversion Efficiency (Per cent.)
1947	33.0	29.2	144.1	309.9	106.4	229.0	202.8	88.5
1948	34.9	29.1	146.6	323.7	104.7	231.2	199.6	85.8
1949	31.5	27.3	149.2	324.1	97.2	211.1	182.7	86.5
1950	34.0	29.7	152.3	355.3	95.7	223.2	194.8	87.3
1951	36.8	32.1	154.9	383.4	96.0	237.6	205.9	87.1
1952	36.5	31.6	157.6	395.1	92.4	231.7	200.6	86.6
1953	37.6	32.6	160.2	412.8	91.1	234.7	201.1	85.7
1954	36.3	31.2	163.0	407.0	89.2	222.7	191.5	86.0
1955	39.7	34.3	165.9	438.0	90.6	239.3	206.7	86.4
1956	41.7	35.8	168.9	446.1	93.5	246.9	211.7	85.7
1957	41.7	35.6	172.0	452.5	92.2	242.4	206.9	85.4
1958	41.7	35.5	174.9	447.3	93.2	238.4	202.8	85.1
1959	43.1	36.4	177.8	475.9	90.6	242.4	205.0	84.6
1960	44.6	38.2	180.7	487.7	91.4	246.8	211.5	85.7
1961	45.3	38.7	183.8	497.2	91.1	246.5	210.6	85.8
1962	47.4	40.5	186.5	529.8	89.5	254.1	217.2	85.5
1963	49.3	42.0	189.2	551.0	89.5	260.5	222.0	85.2
1964	51.2	43.6	191.8	581.1	88.1	266.9	227.3	85.5
1965	53.3	45.3	194.2	617.8	86.3	274.4	232.1	85.0
1966	56.4	47.6	196.5	659.1	85.7	287.0	242.2	83.8
1967	58.3	50.4	198.6	675.2	86.3	293.5	253.8	86.4
1968	61.7	51.7	200.6	706.6	87.3	307.5	257.7	83.7
1969	65.0	54.4	202.6	724.7	89.7	320.8	263.5	83.7
1970	67.4	56.0	204.8	720.0	93.6	329.1	273.6	83.1
1971	68.7	65.8	207.0	741.7	92.6	331.9	274.4	82.7
1972	72.1	59.4	208.8	789.5	91.3	345.3	284.5	82.4

1/ Gross energy is the total of inputs into the economy of the primary fuels (petroleum, natural gas, and coal, including imports) or their derivatives, plus the generation of hydro and nuclear power converted to equivalent energy inputs.

2/ Net energy is the sector inputs (household and commercial, transportation, and industrial), and consists of direct fuels and purchased electricity.

3/ The conversion efficiency factor is the percent of total gross energy going into the sectors.

Table 2.—United States total gross consumption of energy resources by consuming sectors<sup>1/</sup>  
(1947-1972)

Year	Household & Commercial		Industrial		Transportation		Electricity Generation		Miscellaneous		Total Gross Energy Inputs
	Quadrillion Btu	Percent of Total	Quadrillion Btu	Percent of Total	Quadrillion Btu	Percent of Total	Quadrillion Btu	Percent of Total	Quadrillion Btu	Percent of Total	
1947	6.8	20.6	12.8	38.8	8.8	26.7	4.3	13.0	.3	0.9	33.0
1948	7.1	20.9	12.3	36.3	8.8	26.0	4.7	13.9	1.0	3.0	33.9
1949	6.9	21.9	11.4	36.2	8.1	25.7	4.6	14.6	.5	1.6	31.5
1950	7.6	22.3	12.3	36.2	8.6	25.3	5.0	14.7	.5	1.5	34.0
1951	7.9	21.5	13.7	37.2	9.2	25.0	5.3	14.4	.7	1.9	36.8
1952	8.0	21.9	13.1	35.9	9.2	25.2	5.5	15.1	.7	1.9	36.5
1953	7.8	20.7	13.8	36.7	9.2	26.5	5.9	15.7	.9	2.4	37.6
1954	8.0	22.1	12.5	34.4	9.1	25.1	6.0	16.5	.7	1.9	36.3
1955	8.6	21.7	14.1	35.5	9.8	24.7	6.6	16.6	.6	1.5	39.7
1956	9.0	21.6	14.6	35.0	10.1	24.2	7.1	17.0	.9	2.2	41.7
1957	8.7	20.9	14.5	34.8	10.2	24.4	7.3	17.5	1.0	2.4	41.7
1958	9.5	22.8	13.5	32.4	10.3	24.7	7.3	17.3	1.1	2.6	41.7
1959	9.7	22.5	14.0	32.5	10.4	24.1	7.9	18.3	1.1	2.6	43.1
1960	10.2	22.9	14.6	32.7	10.8	24.2	8.3	18.6	.7	1.6	44.6
1961	10.4	22.9	14.6	32.2	11.0	24.3	8.5	18.8	.8	1.8	45.3
1962	10.9	23.0	15.3	32.3	11.4	24.0	9.1	19.2	.7	1.5	47.4
1963	11.0	22.3	15.9	32.3	12.0	24.3	9.7	19.7	.7	1.4	49.3
1964	11.1	21.7	16.7	32.6	12.2	23.8	10.4	20.3	.8	1.6	51.2
1965	11.8	22.2	17.2	32.3	12.7	23.8	11.1	20.8	.5	0.9	53.3
1966	12.4	22.0	18.0	31.9	13.3	23.6	12.1	21.4	.6	1.1	56.4
1967	13.0	22.3	18.3	31.4	14.0	24.0	12.7	21.8	.3	0.5	58.3
1968	13.1	21.2	19.4	31.4	15.2	24.6	13.9	22.5	.2	0.3	61.8
1969	13.6	20.9	20.1	30.9	15.8	24.3	15.3	23.6	.2	0.3	65.0
1970	14.0	20.8	20.4	30.3	16.3	24.2	16.5	24.4	.2	0.3	67.4
1971	14.2	20.7	20.0	29.1	17.1	24.9	17.2	25.0	.2	0.3	68.7
1972 <sup>2/</sup>	14.7	20.4	20.8	28.8	18.0	25.0	18.5	25.7	.1	0.1	72.1

<sup>1/</sup> Gross energy is that contained in all types of commercial energy at the time it is incorporated in the economy, whether the energy is produced domestically or imported. Gross energy comprises inputs of primary fuels (or their derivatives), and outputs of hydropower and nuclear power converted to theoretical energy inputs. Gross energy includes the energy used for the production, processing, and transportation of energy proper.

Table 3. United States Total Gross Consumption of Energy Resources by Major Sources, 1972 Actual, and Projected to the Year 2000 (Base Scenario)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1985	1990	2000
<b>Petroleum products 1/</b>												
Million bbl-----	5,990.2	6,371	6,430	6,490	6,743	7,006	7,279	7,563	7,855	9,345	10,222	12,985
Million bbl/day----	16.5	17.5	17.7	17.8	18.5	19.2	20.0	20.8	21.6	25.6	28.0	35.6
Trillion Btu-----	32,965	35,060	35,490	35,910	37,310	38,770	40,280	41,850	43,530	51,840	57,130	71,380
Percent of total gross inputs----	2/ 45.6	46.4	45.4	45.0	45.3	45.6	45.8	45.8	45.6	44.7	42.9	37.2
<b>Natural Gas</b>												
Trillion Cu.ft.-----	22,429.4	22,654	23,163	23,672	23,909	24,148	24,389	24,633	24,869	26,437	28,056	32,959
Trillion Btu-----	23,125	23,360	23,880	24,400	24,650	24,900	25,150	25,400	25,640	27,250	28,930	33,980
Percent of total gross inputs----	32.0	30.9	30.6	30.6	29.9	29.3	28.6	27.8	26.8	23.5	21.7	17.7
<b>Coal 3/</b>												
Million short tons-----	525.7	560	563	565	584	603	623	643	665	893	998	1,310
Trillion Btu-----	12,604	13,430	13,630	13,830	14,260	14,700	15,160	15,630	16,140	21,470	23,970	31,360
Percent of total gross inputs----	17.4	17.8	17.5	17.3	17.3	17.3	17.2	17.1	16.9	18.5	18.0	16.3
<b>Hydropower</b>												
Million kWhr-----	272.7	277	281	285	290	296	301	307	313	339	362	394
Trillion Btu-----	2,972	2,900	2,950	2,910	2,930	2,960	2,960	2,960	2,970	3,120	3,240	3,350
Percent of total gross inputs----	4.1	3.8	3.8	3.6	3.6	3.5	3.4	3.2	3.1	2.7	2.4	1.7
<b>Nuclear Power</b>												
Million kWhr-----	54.0	75	192	265	296	335	393	489	651	1,130	1,924	5,466
Trillion Btu-----	576	800	2,040	2,610	3,150	3,570	4,180	5,210	6,940	11,750	19,040	49,200
Percent of total gross inputs----	0.8	1.1	2.6	3.3	3.8	4.2	4.8	5.7	7.3	10.1	14.3	25.6
<b>Geothermal</b>												
Million kWhr-----	4/ 4/	4/	4	4	5	6	8	11	14	28	46	121
Trillion Btu-----	4/ 4/	80	80	90	110	120	180	230	300	610	990	2,630
Percent of total gross inputs----	-	-	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.5	0.7	1.4
<b>Total Gross Energy Inputs</b>												
Trillion Btu-----	72,262	75,550	76,370	79,750	82,410	85,020	87,910	91,280	95,520	116,040	133,300	171,900

1/ Includes crude oil, shale oil, and natural gas liquids

2/ Percentage may not add to 100 due to rounding

3/ Includes bituminous, lignite, and anthracite, domestic and imported

4/ Included in hydropower.

Table 4. United States Total Gross Consumption of Energy Resources by Major Sources and Consuming Sectors, 1972 Actual, and Projected to the Year 2000 (Base Scenario)  
(In standard physical units) 1/

Consuming Sector	Coal	Petroleum	Natural Gas	Nuclear Power	Hydropower	Geothermal	Synthetic Gas Distributed	Utility Electricity Distributed
<b>1972</b>								
Household & Commercial	14.7	1,185.9	7,412.5	-	-	-	-	1,020.5
Industrial	160.6	1,079.4	10,272.0	-	-	-	-	729.1
Transportation	0.2	3,221.2	766.2	-	-	-	-	5.3
Electrical generation	350.2	503.7	3,978.7	54.0	272.7	2/	-	(1,754.9)
Synthetic Gas	-	-	-	-	-	-	-	-
Total	525.7	5,990.2	22,429.4	54.0	272.7	-	-	-
<b>1975</b>								
Household and Commercial	12	1,221	8,400	-	-	-	-	1,210
Industrial	169	1,336	10,626	-	-	-	-	858
Transportation	-	3,360	960	-	-	-	-	6
Electrical generation	384	573	3,686	245	285	4	-	(2,074)
Synthetic Gas	-	-	-	-	-	-	-	-
Total	565	6,490	23,672	245	285	4	-	-
<b>1980</b>								
Household and Commercial	11	1,356	9,195	-	-	-	320	1,728
Industrial	175	1,623	10,892	-	-	-	380	1,191
Transportation	-	3,992	1,290	-	-	-	-	9
Electrical generation	460	800	3,492	651	313	14	-	(2,928)
Synthetic Gas	19	84	-	-	-	-	(700)	-
Total	665	7,855	24,869	651	313	14	-	-
<b>1985</b>								
Household and Commercial	4	1,546	9,758	-	-	-	940	2,229
Industrial	190	1,868	11,805	-	-	-	1,060	1,797
Transportation	-	4,739	1,528	-	-	-	-	11
Electrical generation	613	1,064	3,346	1,130	339	28	-	(4,037)
Synthetic Gas	86	128	-	-	-	-	(2,000)	-
Total	893	9,345	26,437	1,130	339	28	-	-
<b>1990</b>								
Household and Commercial	2	1,644	9,906	-	-	-	1,330	2,637
Industrial	207	2,066	13,200	-	-	-	1,475	2,313
Transportation	-	5,626	1,700	-	-	-	-	12
Electrical generation	657	968	3,060	1,924	362	46	-	(4,962)
Synthetic Gas	132	118	-	-	-	-	(2,805)	-
Total	998	10,222	28,056	1,924	362	46	-	-
<b>2000</b>								
Household and Commercial	-	1,953	10,475	-	-	-	2,640	4,326
Industrial	247	7,420	17,701	-	-	-	2,860	4,462
Transportation	-	7,430	2,522	-	-	-	-	15
Electrical generation	755	807	2,561	5,466	394	121	-	(8,821)
Synthetic Gas	308	105	-	-	-	-	(5,500)	-
Total	1,310	12,985	32,959	5,466	394	121	-	-

1/ Coal -- million short tons  
 Petroleum -- million barrels  
 Synthetic gas--billion cu.ft.  
 Natural gas--billion cubic feet  
 Nuclear -- billion kilowatt hr.  
 Utility electricity-- billion kilowatt hr.  
 Hydropower -- billion kilowatt hr.  
 Geothermal -- billion kilowatt hr.

2/ Included in hydropower

Table 3. United States Total Gross Consumption of Energy Resources by Major Sources and Consuming Sectors 1972 Actual, and Projected to the Year 2000 (Base Scenario)

Consuming Sector	(in Trillion Btu)										Total Three Sector Electricity Distributed	
	Coal	Petroleum	Natural Gas	Total Fossil Fuels	Nuclear Power	Hydro-power	Geothermal Power	Total Gross Energy Inputs	Synthetic Gas Distributed	Total Four Sector Inputs		
<b>1972</b>												
Household and Commercial	396	6,735	7,642	14,773	---	---	---	14,773	---	14,773	3,482	18,255
Industrial	4,377	5,771	10,591	20,739	---	---	---	20,739	---	20,739	2,488	23,227
Transportation	4	17,318	790	18,112	---	---	---	18,112	---	18,112	18	18,130
Electrical Generation	7,827	3,141	4,102	15,070	576	2,972	(in hydro)	18,618	---	18,618	(5,988)	---
Synthetic Gas	---	---	---	---	---	---	---	---	---	---	---	---
Total	12,604	32,965	23,125	68,694	576	2,972	---	72,242	---	72,242	---	---
<b>1975</b>												
Household and Commercial	330	6,950	8,660	15,940	---	---	---	15,940	---	15,940	4,130	20,070
Industrial	4,600	7,330	10,950	22,880	---	---	---	22,880	---	22,880	2,930	25,810
Transportation	---	18,050	990	19,040	---	---	---	19,040	---	19,040	20	19,060
Electrical Generation	8,900	3,580	3,800	16,280	2,610	2,910	90	21,890	---	21,890	(7,080)	---
Synthetic Gas	---	---	---	---	---	---	---	---	---	---	---	---
Total	13,830	35,910	26,400	74,140	2,610	2,910	90	79,750	---	79,750	---	---
<b>1980</b>												
Household and Commercial	300	7,720	9,680	17,500	---	---	---	17,500	320	17,820	5,900	23,720
Industrial	4,750	8,930	11,730	24,910	---	---	---	24,910	380	25,290	4,060	29,350
Transportation	---	21,640	1,330	22,770	---	---	---	22,770	---	22,770	30	22,800
Electrical Generation	10,660	5,000	3,600	19,260	6,940	2,970	300	29,470	---	29,470	(9,950)	---
Synthetic Gas	430	640	---	870	---	---	---	870	(700)	---	---	---
Total	16,140	43,530	25,640	85,310	6,940	2,970	300	95,520	---	95,520	---	---
<b>1985</b>												
Household and Commercial	100	8,800	10,060	18,960	---	---	---	18,960	940	19,900	7,610	27,510
Industrial	5,150	10,270	12,160	27,580	---	---	---	27,580	1,080	28,660	6,130	34,790
Transportation	---	29,450	1,980	31,430	---	---	---	31,430	---	31,430	40	31,470
Electrical Generation	14,270	6,970	3,450	24,740	11,750	3,120	610	39,620	---	39,620	(13,780)	---
Synthetic Gas	2,000	670	---	2,670	---	---	---	2,670	(2,000)	---	---	---
Total	21,470	51,840	27,250	109,560	11,750	3,120	610	116,040	---	116,040	---	---
<b>1990</b>												
Household and Commercial	50	9,070	10,215	19,335	---	---	---	19,335	1,330	20,665	9,000	29,665
Industrial	5,620	11,400	13,710	30,730	---	---	---	30,730	1,475	32,205	7,890	40,095
Transportation	---	29,960	1,845	31,805	---	---	---	31,805	---	31,805	40	31,845
Electrical Generation	15,240	6,050	3,160	24,450	19,040	3,240	990	47,720	---	47,720	(16,930)	---
Synthetic Gas	3,050	650	---	3,710	---	---	---	3,710	(2,805)	---	---	---
Total	23,970	57,130	28,930	110,030	19,040	3,240	990	131,300	---	131,300	---	---
<b>2000</b>												
Household and Commercial	---	11,130	10,800	21,930	---	---	---	21,930	2,640	24,570	16,750	39,310
Industrial	6,700	16,640	17,960	39,300	---	---	---	39,300	2,860	42,160	15,280	57,430
Transportation	---	40,010	2,600	42,610	---	---	---	42,610	---	42,610	50	42,660
Electrical Generation	17,520	5,040	2,640	25,200	49,200	3,350	2,630	60,380	---	60,380	(30,090)	---
Synthetic Gas	7,160	530	---	7,690	---	---	---	7,690	(5,500)	---	---	---
Total	31,360	71,380	33,980	136,720	49,200	3,350	2,630	191,900	---	191,900	---	---

Table 6. United States Potential Gross Domestic Production of Energy Resources by Major Sources 1972 actual, and projected to the year 2000 (Base Scenario)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1985	1990	2000
<b>Petroleum 1/</b>												
Million barrels-----	4,255	3,982	3,862	3,767	3,672	3,606	3,763	3,924	4,157	4,000	3,876	3,566
Million bbl/day-----	11.6	10.9	10.6	10.3	10.1	9.9	10.3	10.8	11.4	11.0	10.6	9.8
Trillion Btu-----	23,415	21,980	21,320	20,800	20,270	19,910	20,770	21,660	22,950	22,080	21,400	19,680
Percent of Total Gross Production	37.1	34.4	33.1	32.4	31.6	31.0	31.5	31.8	32.2	27.4	23.0	14.7
<b>Natural Gas</b>												
Billion cu. ft.-----	21,407	22,900	22,243	21,681	21,112	20,703	20,276	19,889	19,480	18,155	18,666	16,618
Trillion Btu-----	22,070	23,610	22,930	22,350	21,770	21,340	20,900	20,510	20,080	18,720	19,240	17,130
Percent of Total Gross Production	34.9	36.9	35.6	34.8	33.9	33.2	31.7	30.2	28.2	23.2	20.7	12.8
<b>Coal 2/</b>												
Million short tons-----	582.4	602	619	636	655	675	695	718	740	980	1,110	1,418
Trillion Btu-----	14,161	14,630	15,040	15,450	15,920	16,400	16,890	17,450	17,980	23,810	26,970	34,460
Percent of Total Gross Production	22.4	22.9	23.4	24.1	24.8	25.5	25.6	25.7	25.2	29.5	29.0	25.6
<b>Shale Oil</b>												
Million bbl-----	-	-	-	-	-	-	-	-	18	91	292	767
Million bbl/day-----	-	-	-	-	-	-	-	-	0.05	0.25	0.8	2.1
Trillion Btu-----	-	-	-	-	-	-	-	-	100	500	1,610	4,230
Percent of Total Gross Production	-	-	-	-	-	-	-	-	0.1	0.6	1.7	3.2
<b>Geothermal</b>												
Billion kWhr-----	3/	4	4	4	5	6	8	11	14	28	63	280
Trillion Btu-----	3/	80	90	90	110	120	180	230	300	610	1,370	6,080
Percent of Total Gross Production	-	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.8	1.5	4.5
<b>Solar</b>												
Trillion Btu-----	-	-	-	-	-	-	-	-	-	insig.	insig.	100
Percent of Total Gross Production	-	-	-	-	-	-	-	-	-	-	-	0.1
<b>Hydropower</b>												
Billion kWhr-----	272.7	277	281	285	290	296	301	307	313	339	362	394
Trillion Btu-----	2,972	2,900	2,950	2,910	2,930	2,960	2,960	2,960	2,970	3,120	3,240	3,350
Percent of Total Gross Production	4.7	4.5	4.6	4.5	4.6	4.6	4.5	4.4	4.2	3.9	3.5	2.5
<b>Nuclear Power</b>												
Billion kWhr-----	54.0	75	192	245	296	335	393	489	651	1,130	1,924	5,466
Trillion Btu-----	576	800	2,040	2,610	3,150	3,570	4,180	5,210	6,940	11,750	19,040	49,200
Percent of Total Gross Production	0.9	1.3	3.2	4.1	4.9	5.6	6.3	7.7	9.7	14.6	20.5	36.6
<b>Total Potential Gross Domestic Production</b>												
Trillion Btu-----	63,194	63,920	64,360	64,210	64,150	64,300	65,880	68,020	71,320	80,590	92,870	134,230

1/ Includes Natural Gas Liquids.

2/ Includes bituminous anthracite and lignite.

3/ Included in hydropower.



Table 7. United States Potential Gross Production of Energy Resources by Major Sources, 1972 actual, and projected to the year 2000 (Intermediate Scenario)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1985	1990	2000
Petroleum 1/												
Million barrels-----	4,255	3,982	3,862	3,785	3,705	3,672	3,833	4,187	4,355	4,577	5,482	4,964
Million barrels/day-----	11.6	10.9	10.6	10.4	10.2	10.1	10.5	11.5	11.9	12.5	15.0	13.6
Trillion Btu-----	23,415	21,980	21,320	20,890	20,430	20,270	21,160	23,110	24,040	25,270	30,260	27,400
Percent of Total Gross Production	37.1	34.4	32.2	31.3	30.4	29.8	29.9	30.9	30.7	25.4	23.8	14.9
Natural Gas												
Billion cubic feet-----	21,407	22,900	22,349	21,922	21,513	21,298	21,093	20,951	20,812	22,455	22,302	18,659
Trillion Btu-----	22,070	23,610	23,040	22,600	22,180	21,960	21,750	21,600	21,460	23,150	22,990	19,240
Percent of Total Gross Production	34.9	36.9	34.8	33.9	33.0	32.2	30.7	28.9	27.4	23.2	18.1	10.4
Coal 2/												
Million short tons-----	582.4	602	685	713	745	775	805	840	876	1,134	1,415	2,190
Trillion Btu-----	14,161	14,630	16,650	17,330	18,100	18,830	19,560	20,410	21,290	27,560	34,390	53,220
Percent of Total Gross Production	22.4	22.9	25.2	26.0	27.0	27.6	27.6	27.3	27.2	27.7	27.0	28.9
Shale Oil												
Million barrels-----	-	-	-	18	37	55	73	91	110	365	621	1,095
Million bbl/day-----	-	-	-	.05	0.1	0.15	0.2	0.25	0.3	1.0	1.7	3.0
Trillion Btu-----	-	-	-	100	200	300	400	500	610	2,010	3,430	6,040
Percent of Total Gross Production	-	-	-	0.1	0.3	0.4	0.6	0.7	0.8	2.0	2.7	3.3
Geothermal												
Billion kWh-----	3/	3/	4	4	5	6	12	21	30	133	210	526
Trillion Btu-----	3/	3/	80	90	110	120	250	460	640	2,890	4,560	11,400
Percent of Total Gross Production	-	-	0.1	0.1	0.2	0.2	0.4	0.6	0.8	2.9	3.6	6.2
Solar												
Trillion Btu-----	-	-	-	-	-	-	-	-	insig	120	800	2,100
Percent of Total Gross Production	-	-	-	-	-	-	-	-	insig	0.1	0.6	1.1
Hydropower												
Billion kWh-----	272.7	277	281	285	290	296	301	307	313	354	390	406
Trillion Btu-----	2,972	2,900	2,950	2,910	2,930	2,960	2,960	2,960	2,970	3,360	3,490	3,450
Percent of Total Gross Production	4.7	4.5	4.5	4.4	4.4	4.3	4.2	4.0	3.8	3.4	2.7	1.9
Nuclear Power												
Billion kWh-----	54.0	75	200	261	300	346	441	534	692	1,472	2,759	6,833
Trillion Btu-----	576	800	2,130	2,780	3,200	3,690	4,700	5,690	7,370	15,310	27,310	61,500
Percent of Total Gross Production	0.9	1.3	3.2	4.2	4.8	5.4	6.7	7.6	9.4	15.4	21.5	33.4
Total Potential Gross Domestic Production												
Trillion Btu-----	63,194	63,920	66,170	66,700	67,160	68,130	70,780	74,730	78,380	99,670	127,230	184,350

1/ Includes Natural Gas Liquids.

2/ Includes bituminous, anthracite, and lignite.

3/ Included in hydropower.

Table 8. United States Potential Gross Production of Energy Resources by Major Sources, 1972 Actual, and Projected to the Year 2000 (High Scenario)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1985	1990	2000
<b>Petroleum 1/</b>												
Million barrels-----	4,255	3,982	3,887	3,902	3,946	3,997	4,285	4,811	4,986	6,194	6,150	4,942
Million barrels/day-----	11.6	10.9	10.7	10.7	10.8	11.0	11.7	13.2	13.7	17.0	16.9	13.5
Trillion Btu-----	23,415	21,980	21,460	21,540	21,780	22,060	23,650	26,560	27,520	34,190	33,950	27,280
Percent of total gross production---	37.1	34.4	31.9	31.3	30.8	30.1	30.4	31.6	30.5	26.2	19.9	10.7
<b>Natural Gas</b>												
Million cubic feet-----	21,407	22,900	22,458	22,188	21,999	22,068	22,214	22,499	23,566	23,981	26,003	18,973
Trillion Btu-----	22,070	23,610	23,160	22,880	22,680	22,750	22,900	23,200	24,320	24,720	26,810	19,560
Percent of total gross production---	34.9	36.9	34.4	33.3	32.2	31.1	29.4	27.6	27.0	19.0	15.7	7.7
<b>Coal 2/</b>												
Million short tons-----	582.4	602	710	754	800	850	905	960	1,023	1,570	1,850	2,625
Trillion Btu-----	14,161	14,630	17,250	18,320	19,440	20,660	21,990	23,330	24,860	38,150	44,960	63,790
Percent of total gross production---	22.4	22.9	25.6	26.6	27.5	28.2	28.2	27.7	27.5	29.3	26.4	25.1
<b>Shale Oil</b>												
Million barrels-----	-	-	-	18	55	73	110	146	183	548	913	1,825
Million barrels/day-----	-	-	-	0.05	0.15	0.2	0.3	0.4	0.5	1.5	2.5	5.0
Trillion Btu-----	-	-	-	100	300	400	610	810	1,010	3,020	5,040	10,070
Percent of total gross production---	-	-	-	0.1	0.4	0.5	0.8	1.0	1.5	2.3	3.0	4.0
<b>Geothermal</b>												
Billion kWhr-----	3/	3/	4	4	5	16	24	41	63	210	280	1,051
Trillion Btu-----	3/	3/	80	90	110	340	510	880	1,370	4,560	6,080	22,800
Percent of total gross production---	-	-	0.1	0.1	0.2	0.5	0.7	1.0	1.5	3.5	3.6	9.0
<b>Solar</b>												
Trillion Btu-----	-	-	-	-	-	-	-	-	120	4,100	17,800	30,500
Percent of total gross production---	-	-	-	-	-	-	-	-	0.1	3.1	10.4	12.0
<b>Hydropower</b>												
Billion kWhr-----	272.7	277	281	285	290	296	301	307	313	362	402	432
Trillion Btu-----	2,972	2,900	2,950	2,910	2,930	2,960	2,960	2,960	2,970	3,360	3,600	3,670
Percent of total gross production---	4.7	4.5	4.4	4.2	4.2	4.0	3.8	3.5	3.3	2.6	2.1	1.4
<b>Nuclear Power</b>												
Billion kWhr-----	54.0	75	232	274	310	375	491	604	757	1,745	3,270	8,541
Trillion Btu-----	576	800	2,470	2,920	3,300	4,000	5,230	6,440	8,070	18,150	32,370	76,870
Percent of total gross production---	0.9	1.3	3.7	4.2	4.7	5.5	6.7	7.7	8.9	13.9	19.0	30.2
<b>Total Potential Gross Domestic Production</b>												
Trillion Btu-----	63,194	63,920	67,370	68,760	70,540	73,170	77,950	84,180	90,240	130,250	170,610	254,540

1/ Includes natural gas liquids

2/ Includes bituminous, anthracite, lignite

3/ Included in hydropower

Table 9. Petroleum Deficits - Base Scenario

	1974	1975	1976	1977	1978	1979	1980	1985	1990	2000
<b>Base Demand:</b>										
Million bbl-----	6,430	6,490	6,743	7,006	7,279	7,563	7,855	9,345	10,222	12,985
Trillion Btu-----	35,490	35,910	37,310	38,770	40,280	41,830	43,530	51,840	57,130	71,380
Million bbl/day-----	17.7	17.6	18.5	19.2	20.0	20.8	21.5	25.6	28.0	35.6
<b>Potential Supply:</b>										
Lower 48										
Million bbl-----	3,862	3,767	3,672	3,606	3,544	3,486	3,427	3,270	3,182	2,945
Trillion Btu-----	21,320	20,800	20,270	19,910	19,560	19,240	18,920	18,050	17,570	16,250
Million bbl/day-----	10.6	10.3	10.1	9.9	9.7	9.6	9.4	9.0	8.7	8.1
Alaska										
Million bbl-----	-	-	-	-	219	438	730	730	694	621
Trillion Btu-----	-	-	-	-	1,210	2,420	4,030	4,030	3,830	3,430
Million bbl/day-----	-	-	-	-	0.6	1.2	2.0	2.0	1.9	1.7
Shale Oil										
Million bbl-----	-	-	-	-	-	-	18	91	292	767
Trillion Btu-----	-	-	-	-	-	-	100	500	1,610	4,230
Million bbl/day-----	-	-	-	-	-	-	.05	.25	0.8	2.1
<b>Total Potential Supply</b>										
Million bbl-----	3,862	3,767	3,672	3,606	3,763	3,924	4,175	4,091	4,168	4,333
Trillion Btu-----	21,320	20,800	20,270	19,910	20,770	21,660	23,050	22,580	23,010	23,910
Million bbl/day-----	10.0	10.3	10.1	9.9	10.3	10.8	11.4	11.2	11.4	11.9
<b>Deficits:</b>										
Million bbl-----	2,568	2,723	3,071	3,400	3,516	3,639	3,680	5,254	6,054	8,652
Trillion Btu-----	14,170	15,110	17,040	18,860	19,510	20,190	20,480	29,260	34,120	47,470
Million bbl/day-----	7.0	7.5	8.4	9.3	9.6	10.0	10.1	14.4	16.6	23.7

Table 10. Petroleum Deficits - Intermediate Scenario

	1974	1975	1976	1977	1978	1979	1980	1985	1990	2000
<b>Base Demand:</b>										
Million bbl-----	6,430	6,490	6,743	7,006	7,279	7,563	7,855	9,345	10,222	12,985
Trillion Btu-----	35,490	35,910	37,310	38,770	40,280	41,850	43,530	51,840	57,130	71,380
Million bbl/day-----	17.7	17.8	18.5	19.2	20.0	20.8	21.6	25.6	28.0	35.6
<b>Potential Supply:</b>										
<u>Lower 48</u>										
Million bbl-----	3,862	3,785	3,705	3,672	3,614	3,639	3,625	3,847	4,022	3,377
Trillion Btu-----	21,320	20,890	20,450	20,270	19,950	20,090	20,010	21,240	22,200	19,760
Million bbl/day-----	10.6	10.4	10.2	10.1	9.9	10.0	9.9	10.5	11.0	9.8
<u>Alaska</u>										
Million bbl-----	-	-	-	-	219	548	730	730	1,460	1,387
Trillion Btu-----	-	-	-	-	1,210	3,020	4,030	4,030	8,060	7,660
Million bbl/day-----	-	-	-	-	0.6	1.5	2.0	2.0	4.0	3.8
<u>Shale Oil</u>										
Million bbl-----	-	18	37	55	73	91	110	365	621	1,095
Trillion Btu-----	-	100	200	300	400	500	610	2,010	3,430	6,040
Million bbl/day-----	-	.05	0.1	.15	0.2	.25	.3	1.0	1.7	3.0
<b>Total Potential Supply</b>										
Million bbl-----	3,862	3,803	3,742	3,727	3,906	4,278	4,465	4,942	6,103	6,059
Trillion Btu-----	21,320	20,990	20,650	20,570	21,560	23,610	24,650	27,280	33,690	33,440
Million bbl/day-----	10.6	10.4	10.3	10.2	10.7	11.7	12.2	13.5	16.7	16.6
<b>Potential Conservation 1/</b>										
Million bbl-----	174	208	250	301	361	431	518	995	1,346	2,143
Trillion Btu-----	960	1,150	1,380	1,660	1,990	2,380	2,860	5,490	7,430	11,830
Million bbl/day-----	0.5	0.6	0.7	0.8	1.0	1.2	1.4	2.7	3.7	5.9
<b>Deficits:</b>										
Million bbl-----	2,394	2,479	2,751	2,978	3,012	2,854	2,872	3,408	2,773	4,783
Trillion Btu-----	13,210	13,770	15,280	16,540	16,730	15,860	16,020	19,070	16,010	26,110
Million bbl/day-----	6.6	6.8	7.5	8.2	8.3	7.8	7.9	9.3	7.6	13.1

1/ Includes conservation in the Household & Commercial, Industrial and Transportation Sectors, but does not include substitutability or conservation of fossil fuels for electrical generation.

Table II. Petroleum Deficits - High Scenario

	1974	1975	1976	1977	1978	1979	1980	1985	1990	2000
<b>Base Demand:</b>										
Million bbl-----	6,430	6,490	6,743	7,006	7,279	7,563	7,855	9,345	10,222	12,985
Trillion Btu-----	35,910	35,910	37,310	38,770	40,280	41,850	43,530	51,840	57,130	71,380
Million bbl/day----	17.7	17.8	18.5	19.2	20.0	20.8	21.6	25.6	28.0	35.6
<b>Potential supply:</b>										
<b>Lower 48:</b>										
Million bbl-----	3,887	3,902	3,946	3,997	4,066	4,154	4,256	4,734	4,690	3,518
Trillion Btu-----	27,460	21,540	21,780	22,060	22,440	22,930	23,490	26,130	25,890	19,420
Million bbl/day----	10.7	10.7	10.8	11.0	11.1	11.4	11.7	13.0	12.8	9.6
<b>Alaska:</b>										
Million bbl-----	-	-	-	-	219	657	730	1,460	1,460	1,424
Trillion Btu-----	-	-	-	-	1,210	3,630	4,030	8,060	8,060	7,860
Million bbl/day----	-	-	-	-	0.6	1.8	2.0	4.0	4.0	3.9
<b>Shale Oil:</b>										
Million bbl-----	-	18	55	73	110	146	183	548	913	1,825
Trillion Btu-----	-	100	300	400	610	810	1,010	3,020	5,040	10,070
Million bbl/day----	-	0.05	.15	0.2	0.3	0.4	0.5	1.5	2.5	5.0
<b>Total Potential Supply:</b>										
Million bbl-----	3,887	3,920	4,001	4,070	4,395	4,957	5,169	6,742	7,063	6,767
Trillion Btu-----	21,460	21,640	22,080	22,460	24,260	27,370	28,530	37,210	38,990	37,350
Million bbl/day----	10.7	10.7	11.0	11.2	12.0	13.6	14.2	18.5	19.4	18.5
<b>Potential Conservation: 1/</b>										
Million bbl-----	308	378	466	571	699	859	1,055	2,067	2,563	3,752
Trillion Btu-----	1,700	2,090	2,570	3,150	3,860	4,740	5,820	11,410	14,150	20,710
Million bbl/day----	0.8	1.0	1.3	1.6	1.9	2.4	2.9	5.7	7.0	10.3
<b>Deficits:</b>										
Million bbl-----	2,235	2,192	2,276	2,365	2,185	1,747	1,631	536	596	2,466
Trillion Btu-----	12,330	12,180	12,660	13,160	12,160	9,740	9,180	3,220	3,990	13,320
Million bbl/day----	6.1	6.0	6.2	6.5	6.0	4.8	4.5	1.5	1.6	6.8

1/ Includes conservation in the Household & Commercial, Industrial, and Transportation Sectors, but does not include substitutability or conservation of fossil fuels for electrical generation.

Table 12. Gaseous Fuel Deficits - Base, Intermediate and High Scenarios

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1985	1990	2000
<b>Base Demand:</b>												
Billion cu.ft.-----	22,429.4	22,654	23,163	23,672	23,909	24,148	24,389	24,633	25,569	28,437	30,861	38,459
Trillion Btu-----	23,125	23,360	23,880	24,400	24,650	24,900	25,150	25,400	26,340	29,250	31,735	39,480
<b>Base Potential Supply :</b>												
Billion cu.ft.-----	21,407	22,900	22,243	21,681	21,112	20,703	20,276	19,889	19,480	18,155	18,666	16,168
Trillion Btu-----	22,070	23,610	22,930	22,350	21,770	21,340	20,900	20,510	20,080	18,720	19,240	17,130
<b>Base Deficits:</b>												
Billion cu.ft.-----	1,022.4	1/-246	920	1,991	2,797	3,445	4,113	4,744	6,089	10,282	12,195	21,841
Trillion Btu-----	1,055	1/-250	950	2,050	2,880	3,560	4,250	4,890	6,260	10,530	12,495	22,350
<b>Intermediate Potential Supply:</b>												
Billion cu.ft.-----	22,531.7	22,900	22,349	21,922	21,513	21,298	21,093	20,951	20,812	22,455	23,302	18,650
Trillion Btu-----	23,230	23,610	23,040	22,600	22,180	21,960	21,750	21,600	21,460	23,150	22,990	19,240
<b>Intermediate Potential Conservation: 2/</b>												
Billion cu.ft.-----	-	-	200	776	902	1,057	1,232	1,445	1,687	2,900	3,987	6,344
Trillion Btu-----	-	-	210	800	930	1,090	1,270	1,490	1,740	3,000	4,110	6,540
<b>Intermediate Deficits:</b>												
Billion cu.ft.-----	1,022.4	1/-246	614	974	1,494	1,793	2,064	2,237	3,070	3,073	4,572	13,456
Trillion Btu-----	1,055	1/-250	630	1,000	1,540	1,850	2,130	2,310	3,140	3,100	4,635	13,700
<b>High Potential Supply:</b>												
Billion cu.ft.-----	22,531.7	22,900	22,458	22,188	21,999	22,068	22,214	22,499	23,586	23,981	26,003	18,973
Trillion Btu-----	23,230	23,610	23,160	22,880	22,680	22,750	22,900	23,200	24,320	24,720	26,810	19,560
<b>High Potential Conservation: 2/</b>												
Billion cu.ft.-----	-	-	250	1,009	1,193	1,416	1,668	1,979	2,337	4,093	5,316	7,953
Trillion Btu-----	-	-	260	1,040	1,230	1,460	1,720	2,040	2,410	4,220	5,480	8,200
<b>High Deficits:</b>												
Billion cu.ft.-----	1,022.4	1/-246	455	475	717	664	507	155	-354	363	-458	11,533
Trillion Btu-----	1,055	1/-250	460	480	740	690	530	160	-390	310	-555	11,720

1/ Apparent surplus due to supply definition of "Marketed production." Actual deficit will amount to an estimated 1 trillion cu.ft.

2/ Includes conservation in the Household & Commercial, Industrial, and Transportation Sectors, but does not include interfuel substitutability or conservation in the Electrical Generation Sector.

Table 13. Coal Surpluses - Base, Intermediate, and High Scenarios

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1985	1990	2000
<b>Base Demand 1/</b>												
Million Tons-----	582.4	602	619	636	655	675	695	718	740	980	1,110	1,418
Trillion Btu-----	14,161	14,630	15,040	15,450	15,920	16,400	16,890	17,450	17,980	23,810	26,970	34,460
<b>Base Scenario Potential Supply 1/</b>												
Million Tons-----	582.4	602	619	636	655	675	695	718	740	980	1,110	1,418
Trillion Btu-----	14,161	14,630	15,040	15,450	15,920	16,400	16,890	17,450	17,980	23,810	26,970	34,460
<b>Base Scenario Deficits</b>												
Million Tons-----	-	-	-	-	-	-	-	-	-	-	-	-
Trillion Btu-----	-	-	-	-	-	-	-	-	-	-	-	-
<b>Intermediate Scenario Potential Supply 2/</b>												
Million Tons-----	582.4	602	685	713	745	775	805	840	876	1,134	1,415	2,190
Trillion Btu-----	14,161	14,630	16,650	17,330	18,100	18,830	19,560	20,410	21,290	27,560	34,390	53,220
<b>Intermediate Scenario Potential Conservation 2/</b>												
Million Tons-----	8	17	190	420	410	16	16	15	14	61	78	117
Trillion Btu-----	-	-	-	-	-	390	380	360	350	1,480	1,890	2,840
<b>Intermediate Scenario Deficits 3/</b>												
Million Tons-----	-	-	-74	-94	-107	-116	-126	-137	-150	-215	-383	-889
Trillion Btu-----	-	-	-1,800	-2,300	-2,590	-2,820	-3,050	-3,320	-3,660	-5,230	-9,310	-21,600
<b>High Scenario Potential Supply 1/</b>												
Million Tons-----	582.4	602	710	754	800	850	905	960	1,022	1,570	1,850	2,625
Trillion Btu-----	14,161	14,630	17,250	18,320	19,440	20,660	21,990	23,330	24,860	38,150	44,960	63,790
<b>High Scenario Potential Conservation 2/</b>												
Million Tons-----	-	-	10	18	21	26	30	36	43	65	83	124
Trillion Btu-----	-	-	240	440	520	620	740	880	1,040	1,570	2,020	3,010
<b>High Scenario Deficits 3/</b>												
Million Tons-----	-	-	-101	-136	-166	-201	-240	-278	-326	-655	-823	-1,331
Trillion Btu-----	-	-	-2,450	-3,310	-4,040	-4,880	-5,840	-6,760	-7,920	-15,910	-20,010	-32,340

1/ Includes projected exports.

2/ Includes conservation in the industrial sectors. Interfuel substitutability and conservation in the electrical generation sector is not included however.

3/ ( - ) number indicates surpluses.

Table 14. Hydropower Surpluses - Base, Intermediate, and High Scenarios

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1985	1990	2000
<u>Base Demand</u>												
Billion Kwhrs-----	272.7	277	281	285	290	296	301	307	313	339	362	394
Trillion Btu-----	2,972	2,900	2,950	2,910	2,930	2,960	2,960	2,960	2,970	3,120	3,240	3,350
<u>Base Scenario Potential Supply</u>												
Billion Kwhrs-----	272.7	277	281	285	290	296	301	307	313	339	362	394
Trillion Btu-----	2,972	2,900	2,950	2,910	2,930	2,960	2,960	2,960	2,970	3,120	3,240	3,350
<u>Base Scenario Deficits 1/</u>												
Billion Kwhrs-----	-	-	-	-	-	-	-	-	-	-	-	-
Trillion Btu-----	-	-	-	-	-	-	-	-	-	-	-	-
<u>Intermediate Scenario Potential Supply</u>												
Billion Kwhrs-----	272.7	277	281	285	290	296	301	307	313	354	390	406
Trillion Btu-----	2,972	2,900	2,950	2,910	2,930	2,960	2,960	2,960	2,970	3,360	3,490	3,450
<u>Intermediate Scenario Deficits 1/</u>												
Billion Kwhrs-----	272.7	-	-	-	-	-	-	-	-	-15	-28	-12
Trillion Btu-----	2,972	-	-	-	-	-	-	-	-	-240	-250	-100
<u>High Scenario Potential Supply</u>												
Billion Kwhrs-----	272.7	277	281	285	290	296	301	307	313	362	402	432
Trillion Btu-----	2,972	2,900	2,950	2,910	2,930	2,960	2,960	2,960	2,970	3,360	3,600	3,670
<u>High Scenario Deficits 1/</u>												
Billion Kwhrs-----	272.7	-	-	-	-	-	-	-	-	-23	-40	-38
Trillion Btu-----	2,972	-	-	-	-	-	-	-	-	-240	-360	-320

1/ (-) number indicates surplus.



Table 15. Nuclear Surpluses - Base, Intermediate and High Scenarios

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1985	1990	2000
<u>Base Demand</u>												
Billion Kwhr-----	54.0	75	192	245	296	335	393	489	651	1,130	1,924	5,466
Trillion Btu-----	576	800	2,040	2,610	3,150	3,570	4,180	5,210	6,940	11,750	19,040	49,200
<u>Base Scenario-Potential Supply</u>												
Billion Kwhr-----	54.0	75	192	245	296	335	393	489	651	1,130	1,924	5,466
Trillion Btu-----	576	800	2,040	2,610	3,150	3,570	4,180	5,210	6,940	11,750	19,040	49,200
<u>Base Scenario-Deficits 1/</u>												
Billion Kwhr-----	-	-	-	-	-	-	-	-	-	-	-	-
Trillion Btu-----	-	-	-	-	-	-	-	-	-	-	-	-
<u>Intermediate Scenario-Potential Supply</u>												
Billion Kwhr-----	54.0	75	200	261	300	346	441	534	692	1,472	2,759	6,833
Trillion Btu-----	576	800	2,130	2,780	3,200	3,690	4,700	5,690	7,370	15,310	27,310	61,500
<u>Intermediate Scenario-Deficits 1/</u>												
Billion Kwhr-----	-	-	-8	-16	-4	-11	-48	-45	-41	-342	-835	-1,367
Trillion Btu-----	-	-	-90	-170	-50	-120	-520	-480	-430	-3,560	-8,270	-12,300
<u>High Scenario-Potential Supply</u>												
Billion Kwhr-----	54.0	75	232	274	310	375	491	604	757	1,745	3,270	8,541
Trillion Btu-----	576	800	2,470	2,920	3,300	4,000	5,230	6,440	8,070	18,150	32,370	76,870
<u>High Scenario-Deficits 1/</u>												
Billion Kwhr-----	-	-	-40	-29	-14	-40	-98	-115	-106	-615	-1,346	-3,075
Trillion Btu-----	-	-	-430	-310	-150	-430	-1,050	-1,230	-1,130	-6,400	-13,330	-27,670

1/ (-) number indicates surplus

Table 16. Geothermal Surpluses - Base, Intermediate and High Scenarios

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1985	1990	2000
<u>Base Demand</u>	-	-	4	4	5	6	8	11	14	28	46	121
Billion Kwhrs -----	-	-	80	90	110	120	180	230	300	610	990	2,630
Trillion Btu-----												
<u>Base Scenario-Potential Supply</u>	-	-	4	4	5	6	8	11	14	28	63	280
Billion Kwhr-----	-	-	80	90	110	120	180	230	300	610	1,370	6,080
Trillion Btu-----												
<u>Base Scenario-Deficits 1/</u>	-	-	-	-	-	-	-	-	-	-	-17	-159
Billion Kwhr-----	-	-	-	-	-	-	-	-	-	-	-380	-3,450
Trillion Btu-----												
<u>Intermediate Scenario-Potential Supply</u>	-	-	4	4	5	6	12	21	30	133	210	526
Billion Kwhr-----	-	-	80	90	110	120	250	460	640	2,890	4,560	11,400
Trillion Btu-----												
<u>Intermediate Scenario-Deficits 1/</u>	-	-	-	-	-	-	-4	-10	-16	-105	-164	-405
Billion Kwhr-----	-	-	-	-	-	-	-70	-230	-340	-2,280	-3,570	-8,770
Trillion Btu-----												
<u>High Scenario-Potential Supply</u>	-	-	4	4	5	16	24	41	63	210	280	1,051
Billion Kwhr-----	-	-	80	90	110	340	510	880	1,370	4,560	6,080	22,800
Trillion Btu-----												
<u>High Scenario-Deficits 1/</u>	-	-	-	-	-	-10	-16	-30	-49	-182	-234	-930
Billion Kwhr-----	-	-	-	-	-	-220	-330	-650	-1,070	-3,950	-5,090	-20,170
Trillion Btu-----												

1/ (-) number indicates surplus

Table 17-Solar Surpluses - Base, Intermediate, and High Scenarios

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1985	1990	2000
<u>Base Demand</u>												
Trillion Btu-----	-	-	-	-	-	-	-	-	-	-	-	-
<u>Base Scenario-Potential Supply</u>												
Trillion Btu-----	-	-	-	-	-	-	-	-	-	insig.	insig.	100
<u>Base Scenario-Deficits 1/</u>												
Trillion Btu-----	-	-	-	-	-	-	-	-	-	insig.	insig.	-100
<u>Intermediate Scenarib-</u>												
<u>Potential Supply</u>												
Trillion Btu-----	-	-	-	-	-	-	-	-	insig.	120	800	2,100
<u>Intermediate.Scenario-Deficits 1/</u>												
Trillion Btu-----	-	-	-	-	-	-	-	-	insig.	-120	-800	-2,100
<u>High Scenario-Potential Supply</u>												
Trillion Btu-----	-	-	-	-	-	-	-	-	120	4,100	17,800	30,500
<u>High Scenario-Deficits 1/</u>												
Trillion Btu-----	-	-	-	-	-	-	-	-	-120	-4,100	-17,800	-30,500

1/ (-) number indicates surplus

Table 18. Net Energy Conservation by Sector and Source 1975-2000,  
(Intermediate Scenario)

Energy Savings	Coal		Petroleum		Natural Gas	Electricity		Total Savings
	Mil. tons.	Tril. Btu	Mil. bbl	Tril. Btu		Bil. cu. ft.	Bil. Kwhr.	
<b>1975</b>								
Household & Commercial	-	-	-	-	-	-	-	-
Industrial	17	420	49	270	776	800	3	1,500
Transportation	159	880	0.4	880	-	-	-	880
Total	17	420	208	1,150	776	800	3	2,380
<b>1980</b>								
Household & Commercial	-	-	7	40	48	50	9	120
Industrial	14	350	103	570	1,639	1,690	3	2,620
Transportation	408	2,250	1.1	2,250	-	-	-	2,250
Total	14	350	518	2,860	1,687	1,740	12	4,990
<b>1985</b>								
Household & Commercial	-	-	18	100	145	150	29	350
Industrial	61	1,480	178	980	2,764	2,850	6	5,330
Transportation	799	4,410	2.2	4,410	-	-	-	4,410
Total	61	1,480	995	5,490	2,909	3,000	35	10,090
<b>1990</b>								
Household & Commercial	-	-	78	430	398	410	47	1,000
Industrial	78	1,890	228	1,260	3,589	3,700	108	7,220
Transportation	1,040	5,740	2.8	5,740	-	-	-	5,740
Total	78	1,890	1,346	7,430	3,987	4,110	155	13,960
<b>2000</b>								
Household & Commercial	-	-	203	1,120	951	980	108	2,470
Industrial	117	2,840	333	1,840	5,393	5,560	322	11,340
Transportation	1,607	8,870	4.4	8,870	-	-	-	8,870
Total	117	2,840	2,143	11,830	6,344	6,540	430	22,680

note: digits may not add to totals due to random rounding.

Table 19. Net Energy Conservation by Sector and Source, 1975-2000,  
(High Scenario)

Energy Savings	Coal		Petroleum		Natural Gas		Electricity		Total Savings
	(Mil. EnB.)	(Tril. Btu)	(Mil. bbl.)	(Tril. Btu)	(Mil. cu.ft.)	(Tril. Btu)	(Bil. kWh)	(Tril. Btu)	
<b>1975</b>									
Household & Commercial	-	34	190	0.1	175	180	15	50	420
Industrial	18	440	580	0.3	834	860	3	10	1,890
Transportation	-	239	1,320	0.7	-	-	-	-	1,320
Total	18	440	2,090	1.0	1,009	1,040	18	60	3,630
<b>1980</b>									
Household & Commercial	-	109	600	0.3	543	560	59	200	1,360
Industrial	43	1,040	1,380	0.7	1,794	1,850	12	40	4,310
Transportation	-	696	3,840	1.9	-	-	-	-	3,840
Total	43	1,040	5,820	2.9	2,337	2,410	71	240	9,510
<b>1985</b>									
Household & Commercial	-	203	1,120	0.6	1,018	1,050	149	510	2,680
Industrial	65	1,570	2,600	1.3	3,075	3,170	21	70	7,410
Transportation	-	1,393	7,690	3.8	-	-	-	-	7,690
Total	65	1,570	11,410	5.7	4,093	4,220	170	580	17,780
<b>1990</b>									
Household & Commercial	-	275	1,520	0.8	1,339	1,380	208	710	3,610
Industrial	83	2,020	3,190	1.6	3,977	4,100	120	410	9,720
Transportation	-	1,710	9,440	4.7	-	-	-	-	9,440
Total	83	2,020	14,150	7.0	5,316	5,480	328	1,120	22,770
<b>2000</b>									
Household & Commercial	-	428	2,360	1.2	1,969	2,030	366	1,250	5,640
Industrial	124	3,010	4,880	2.4	5,984	6,170	328	1,120	15,180
Transportation	-	2,440	13,470	6.7	-	-	-	-	13,470
Total	124	3,010	20,710	10.3	7,953	8,200	694	2,370	34,290

note: digits may not add to totals due to random rounding.

Table 20. Petroleum Consumption in the Household & Commercial, Industrial, and Transportation Sectors, 1975-2000 - Intermediate Scenario (with and without Energy Conservation)

	Base Consumption		Potential Conservation		Consumption w/ conserv.	
	Million barrels	Trillion Btu	Million barrels	Trillion Btu	Million barrels	Trillion Btu
<u>1975</u>						
Household & Commercial	1,221	6,950	-	-	1,221	6,950
Industrial	1,336	7,330	49	270	1,287	7,060
Transportation	3,360	18,050	159	880	3,201	17,170
Total	5,917	32,330	208	1,150	5,709	31,180
<u>1980</u>						
Household & Commercial	1,356	7,720	7	40	1,349	7,680
Industrial	1,623	8,930	103	570	1,520	8,360
Transportation	3,992	21,440	408	2,250	3,584	19,190
Total	6,971	38,090	518	2,860	6,453	35,230
<u>1985</u>						
Household & Commercial	1,546	8,800	18	100	1,528	8,700
Industrial	1,868	10,270	178	980	1,690	9,290
Transportation	4,739	25,450	799	4,410	3,940	21,040
Total	8,153	44,520	995	5,490	7,158	39,030
<u>1990</u>						
Household & Commercial	1,644	9,070	78	430	1,566	8,640
Industrial	2,066	11,400	228	1,260	1,838	10,140
Transportation	5,426	29,960	1,040	5,740	4,386	24,220
Total	9,136	50,430	1,346	7,430	7,790	43,000
<u>2000</u>						
Household & Commercial	1,953	11,120	203	1,120	1,750	10,000
Industrial	3,670	14,660	333	1,840	2,337	12,820
Transportation	7,450	40,010	1,607	8,870	5,843	31,140
Total	12,073	65,790	2,143	11,830	9,930	53,960

Table 21. Petroleum Consumption in the Household & Commercial, Industrial, and Transportation Sectors, 1975-2000 - High Scenario (with and without Energy Conservation)

	Base Consumption		Potential Conservation		Consumption w/Conservation	
	Million barrels	Trillion Btu	Million barrels	Trillion Btu	Million barrels	Trillion Btu
<b>1975</b>						
Household & Commercial	1,221	6,950	34	190	1,187	6,760
Industrial	1,336	7,330	105	580	1,231	6,750
Transportation	<u>3,360</u>	<u>18,050</u>	<u>239</u>	<u>1,320</u>	<u>3,121</u>	<u>16,730</u>
Total	5,917	32,330	378	2,090	5,539	30,240
<b>1980</b>						
Household & Commercial	1,356	7,720	109	600	1,247	7,120
Industrial	1,623	8,930	250	1,380	1,373	7,550
Transportation	<u>3,992</u>	<u>21,440</u>	<u>696</u>	<u>3,840</u>	<u>3,296</u>	<u>17,600</u>
Total	6,971	38,090	1,055	5,820	5,916	32,270
<b>1985</b>						
Household & Commercial	1,546	8,800	203	1,120	1,343	7,680
Industrial	1,868	10,270	471	2,600	1,397	7,670
Transportation	<u>4,739</u>	<u>25,450</u>	<u>1,393</u>	<u>7,690</u>	<u>3,346</u>	<u>17,760</u>
Total	8,153	44,520	2,067	11,410	6,086	33,110
<b>1990</b>						
Household & Commercial	1,644	9,070	275	1,520	1,369	7,550
Industrial	2,066	11,400	578	3,190	1,488	8,210
Transportation	<u>5,426</u>	<u>29,960</u>	<u>1,710</u>	<u>9,440</u>	<u>3,716</u>	<u>20,520</u>
Total	9,136	50,430	2,563	14,150	6,573	36,820
<b>2000</b>						
Household & Commercial	1,953	11,120	428	2,360	1,525	8,760
Industrial	2,670	14,660	884	4,880	1,786	9,780
Transportation	<u>7,450</u>	<u>40,010</u>	<u>2,440</u>	<u>13,470</u>	<u>5,010</u>	<u>26,540</u>
Total	12,073	65,790	3,752	20,710	8,321	45,080

Table 22. Gaseous Fuels Consumption in the Household & Commercial, Industrial, and Transportation Sectors, 1975-2000, Intermediate Scenario (with and without conservation)

	Base Consumption		Potential Conservation		Consumption With Conservation	
	Billion cu. ft.	Trillion Btu	Billion cu. ft.	Trillion Btu	Billion cu. ft.	Trillion Btu
<u>1975</u>						
Household & Commercial	8,400	8,660	-	-	8,400	8,660
Industrial	10,626	10,950	776	800	9,850	10,150
Transportation	960	990	-	-	960	990
Total	<u>19,986</u>	<u>20,600</u>	<u>776</u>	<u>800</u>	<u>19,210</u>	<u>19,800</u>
<u>1980</u>						
Household & Commercial	9,195	9,480	48	50	9,147	9,430
Industrial	10,892	11,230	1,639	1,690	9,253	9,540
Transportation	1,290	1,330	-	-	1,290	1,330
Total	<u>21,377</u>	<u>22,040</u>	<u>1,687</u>	<u>1,740</u>	<u>19,690</u>	<u>20,300</u>
<u>1985</u>						
Household & Commercial	9,758	10,060	145	150	9,613	9,910
Industrial	11,805	12,160	2,764	2,850	9,041	9,310
Transportation	1,528	1,580	-	-	1,528	1,580
Total	<u>23,091</u>	<u>23,800</u>	<u>2,909</u>	<u>3,000</u>	<u>20,182</u>	<u>20,800</u>
<u>1990</u>						
Household & Commercial	9,906	10,215	398	410	9,508	9,805
Industrial	13,300	13,710	3,589	3,700	9,711	10,010
Transportation	1,790	1,845	-	-	1,790	1,845
Total	<u>24,996</u>	<u>25,770</u>	<u>3,987</u>	<u>4,110</u>	<u>21,009</u>	<u>21,660</u>
<u>2000</u>						
Household & Commercial	10,475	10,800	951	980	9,524	9,820
Industrial	17,401	17,940	5,393	5,560	12,008	12,380
Transportation	2,522	2,600	-	-	2,522	2,600
Total	<u>30,398</u>	<u>31,340</u>	<u>6,344</u>	<u>6,540</u>	<u>24,054</u>	<u>24,800</u>



Table 23. Gaseous Fuels Consumption in the Household & Commercial, Industrial, and Transportation Sectors, 1975-2000, High Scenario (with and without conservation)

	Base Consumption		Potential Conservation		Consumption with Conservation	
	Billion cu. ft.	Trillion Btu	Billion cu. ft.	Trillion Btu	Billion cu. ft.	Trillion Btu
<b>1975</b>						
Household & Commercial	8,400	8,660	175	180	8,225	8,480
Industrial	10,626	10,950	834	860	9,792	10,090
Transportation	960	990	-	-	960	990
Total	19,986	20,600	1,009	1,040	18,977	19,560
<b>1980</b>						
Household & Commercial	9,195	9,480	543	560	8,652	8,920
Industrial	10,892	11,280	1,794	1,850	9,098	9,380
Transportation	1,290	1,330	-	-	1,290	1,330
Total	21,377	22,040	2,337	2,410	19,040	19,360
<b>1985</b>						
Household & Commercial	9,758	10,060	1,018	1,050	8,740	9,010
Industrial	11,805	12,160	3,075	3,170	8,730	8,990
Transportation	1,528	1,580	-	-	1,528	1,580
Total	23,091	23,800	4,093	4,220	18,998	19,580
<b>1990</b>						
Household & Commercial	9,906	10,215	1,339	1,380	8,567	8,835
Industrial	13,300	13,710	3,977	4,100	9,323	9,610
Transportation	1,790	1,845	-	-	1,790	1,845
Total	24,996	25,770	5,316	5,480	19,680	20,290
<b>2000</b>						
Household & Commercial	10,475	10,800	1,969	2,030	8,506	8,770
Industrial	17,401	17,940	5,984	6,170	11,417	11,770
Transportation	2,522	2,600	-	-	2,522	2,600
Total	30,398	31,340	7,953	8,200	22,445	23,140

Table 24. Consumption of Coal in the Household and Commercial, Industrial, and Transportation Sectors, 1975-2000 (Intermediate Scenario) (with and without energy conservation)

	Base Consumption		Conservation		Consumption w/conservation	
	10 <sup>6</sup> ton	10 <sup>12</sup> Btu	10 <sup>6</sup> ton	10 <sup>12</sup> Btu	10 <sup>6</sup> ton	10 <sup>12</sup> Btu
<u>1975</u>						
Household and Commercial-----	12	330	-	-	12	330
Industrial-----	169	4,600	17	420	152	4,180
Transportation-----	-	-	-	-	-	-
Total-----	<u>181</u>	<u>4,930</u>	<u>17</u>	<u>420</u>	<u>164</u>	<u>4,510</u>
<u>1980</u>						
Household and Commercial-----	11	300	-	-	11	300
Industrial-----	175	4,750	14	350	161	4,400
Transportation-----	-	-	-	-	-	-
Total-----	<u>186</u>	<u>5,050</u>	<u>14</u>	<u>350</u>	<u>172</u>	<u>4,700</u>
<u>1985</u>						
Household and Commercial-----	4	100	-	-	4	100
Industrial-----	190	5,150	61	1,480	129	3,670
Transportation-----	-	-	-	-	-	-
Total-----	<u>194</u>	<u>5,250</u>	<u>61</u>	<u>1,480</u>	<u>133</u>	<u>3,770</u>
<u>1990</u>						
Household and Commercial-----	2	50	-	-	2	50
Industrial-----	207	5,620	78	1,890	129	3,730
Transportation-----	-	-	-	-	-	-
Total-----	<u>209</u>	<u>5,670</u>	<u>78</u>	<u>1,890</u>	<u>131</u>	<u>3,780</u>
<u>2000</u>						
Household and Commercial-----	-	-	4	-	-	-
Industrial-----	247	6,700	117	2,840	130	3,860
Transportation-----	-	-	-	-	-	-
Total-----	<u>247</u>	<u>6,700</u>	<u>117</u>	<u>2,840</u>	<u>130</u>	<u>3,860</u>

Table 25. Consumption of Coal in the Household and Commercial, Industrial, and Transportation Sectors - 1975-2000 (High Scenario) (with and without energy conservation)

	Base Consumption		Conservation		Consumption w/conservation	
	10 <sup>6</sup> ton	10 <sup>12</sup> Btu	10 <sup>6</sup> ton	10 <sup>12</sup> Btu	10 <sup>6</sup> ton	10 <sup>12</sup> Btu
<u>1975</u>						
Household and Commercial-----	12	300	-	-	12	330
Industrial-----	169	4,600	18	440	151	4,160
Transportation-----	-	-	-	-	-	-
Total-----	<u>181</u>	<u>4,930</u>	<u>18</u>	<u>440</u>	<u>163</u>	<u>4,490</u>
<u>1980</u>						
Household and Commercial-----	11	300	-	-	11	300
Industrial-----	175	4,750	43	1,040	132	3,710
Transportation-----	-	-	-	-	-	-
Total-----	<u>186</u>	<u>5,050</u>	<u>43</u>	<u>1,040</u>	<u>143</u>	<u>4,010</u>
<u>1985</u>						
Household and Commercial-----	4	100	-	-	4	100
Industrial-----	190	5,150	65	1,570	125	3,580
Transportation-----	-	-	-	-	-	-
Total-----	<u>194</u>	<u>5,250</u>	<u>65</u>	<u>1,570</u>	<u>129</u>	<u>3,680</u>
<u>1990</u>						
Household and Commercial-----	2	50	-	-	2	50
Industrial-----	207	5,620	83	2,020	124	3,600
Transportation-----	-	-	-	-	-	-
Total-----	<u>209</u>	<u>5,620</u>	<u>83</u>	<u>2,020</u>	<u>126</u>	<u>3,650</u>
<u>2000</u>						
Household and Commercial-----	-	-	-	-	-	-
Industrial-----	247	6,700	124	3,010	123	3,690
Transportation-----	-	-	-	-	-	-
Total-----	<u>247</u>	<u>6,700</u>	<u>124</u>	<u>3,010</u>	<u>123</u>	<u>3,690</u>

Table 26. Consumption of Utility Electricity in the Household & Commercial Industrial, & Transportation Sectors - 1975-2000-Intermediate Scenarios (with & without energy conservation)

	Base Consumption		Conservation		Consumption w/Conservation	
	Billion Kwhr	Trillion Btu	Billion Kwhr	Trillion Btu	Billion Kwhr	Trillion Btu
<b>1975</b>						
Household & Commercial	1,210	4,130	-	-	1,210	4,130
Industrial	858	2,930	3	10	855	2,920
Transportation	6	20	-	-	6	20
Total	2,074	7,080	3	10	2,071	7,070
<b>1980</b>						
Household & Commercial	1,728	5,900	9	30	1,719	5,870
Industrial	1,191	4,060	3	10	1,188	4,050
Transportation	9	30	-	-	9	30
Total	2,928	9,990	12	40	2,916	9,950
<b>1985</b>						
Household & Commercial	2,229	7,610	29	100	2,200	7,510
Industrial	1,797	6,130	6	20	1,791	6,110
Transportation	11	40	-	-	11	40
Total	4,037	13,780	35	120	4,002	13,660
<b>1990</b>						
Household & Commercial	2,637	9,000	47	160	2,590	8,840
Industrial	2,313	7,890	108	370	2,205	7,520
Transportation	12	40	-	-	12	40
Total	4,962	16,930	155	530	4,807	16,400
<b>2000</b>						
Household & Commercial	4,324	14,750	108	370	4,216	14,380
Industrial	4,482	15,290	322	1,100	4,160	14,190
Transportation	15	50	-	-	15	50
Total	8,821	30,090	430	1,470	8,391	28,620

Table 27. Consumption of Utility Electricity in the Household and Commercial, Industrial, and Transportation Sectors-1975-2000 (High Scenario)  
(with and without energy conservation)

	Base Consumption		Conservation		Consumption w/conservation	
	Billion Kwhr	Trillion Btu	Billion Kwhr	Trillion Btu	Billion Kwhr	Trillion Btu
<u>1975</u>						
Household and Commercial	1,210	4,130	15	50	1,195	4,080
Industrial	858	2,930	3	10	855	2,920
Transportation	6	20	-	-	6	20
Total	<u>2,074</u>	<u>7,080</u>	<u>18</u>	<u>60</u>	<u>2,056</u>	<u>7,020</u>
<u>1980</u>						
Household and Commercial	1,728	5,900	59	200	1,669	5,700
Industrial	1,191	4,060	12	40	1,179	4,020
Transportation	9	30	-	-	9	30
Total	<u>2,928</u>	<u>9,990</u>	<u>71</u>	<u>240</u>	<u>2,857</u>	<u>9,750</u>
<u>1985</u>						
Household and Commercial	2,229	7,610	149	510	2,080	7,100
Industrial	1,797	6,130	21	70	1,776	6,060
Transportation	11	40	-	-	11	40
Total	<u>4,037</u>	<u>13,780</u>	<u>170</u>	<u>580</u>	<u>3,867</u>	<u>13,200</u>
<u>1990</u>						
Household and Commercial	2,637	9,000	208	710	2,429	8,290
Industrial	2,313	7,890	120	410	2,193	7,480
Transportation	12	40	-	-	12	40
Total	<u>4,962</u>	<u>16,930</u>	<u>328</u>	<u>1,120</u>	<u>4,634</u>	<u>15,810</u>
<u>2000</u>						
Household and Commercial	4,324	14,750	366	1,250	3,958	13,500
Industrial	4,482	15,290	328	1,120	4,154	14,170
Transportation	15	50	-	-	15	50
Total	<u>8,821</u>	<u>30,090</u>	<u>694</u>	<u>2,370</u>	<u>8,127</u>	<u>27,720</u>

Table 28. Mixed Strategy Scenario - Petroleum Surpluses &amp; Deficits, 1974-2000

	1974	1975	1976	1977	1978	1979	1980	1985	1990	2000
<b>Total High Scenario Demand</b>										
(Including High Scenario Potential Conservation Levels)										
Million barrels-----	6,122	6,112	6,277	6,435	6,580	6,704	6,800	7,278	7,659	9,233
Million barrels/day-----	16.8	16.7	17.2	17.6	18.0	18.4	18.6	19.9	21.0	25.3
Trillion Btu-----	33,790	33,820	34,740	35,620	36,420	37,110	37,710	40,430	42,980	50,670
<b>Total High Scenario Potential</b>										
Domestic Supply 1/										
Million Barrels-----	3,887	3,920	4,001	4,070	4,395	4,957	5,169	6,742	7,063	6,767
Million barrels/day-----	10.7	10.7	11.0	11.2	12.0	13.6	14.2	18.5	19.4	18.5
Trillion Btu-----	21,460	21,640	22,080	22,460	24,260	27,370	28,530	37,210	38,990	37,350
<b>Total Intermediate Scenario</b>										
Potential Imports 2/										
Million barrels-----	1,749	1,935	2,108	2,263	2,391	2,464	2,500	2,446	2,300	1,862
Million barrels/day-----	4.8	5.3	5.8	6.2	6.6	6.8	6.8	6.7	6.3	5.1
Trillion Btu-----	9,650	10,680	11,640	12,490	13,200	13,600	13,800	13,500	12,700	10,280
<b>Total Potential Supply</b>										
Million barrels-----	5,636	5,855	6,109	6,333	6,786	7,421	7,669	9,188	9,363	8,629
Million barrels/day-----	15.4	16.0	16.7	17.4	18.6	20.3	21.0	25.2	25.7	23.6
Trillion Btu-----	31,110	32,320	33,720	34,950	37,460	40,970	42,330	50,710	51,690	47,630
<b>Deficits 3/</b>										
Million barrels-----	486	257	168	102	-206	-717	-869	-1,910	-1,704	604
Million barrels/day-----	1.3	0.7	0.5	0.3	-0.3	-2.0	-2.4	-5.2	-4.7	1.7
Trillion Btu-----	2,680	1,500	1,020	670	-1,040	-3,860	-4,620	-10,280	-8,710	3,040

1/ Includes Lower 48, Alaska, shale oil and natural gas liquids, and crude petroleum

2/ From non-Arab nations, i.e. Canada, Caribbean, South America, Iran, and S.E. Asia, includes crude oil and petroleum products.

3/ (-) number indicates surplus.

Table 29. Mixed Strategy Scenario - Gaseous Fuels Surpluses &amp; Deficits, 1974-2000

	1974	1975	1976	1977	1978	1979	1980	1985	1990	2000
<b>High Scenario Demand (including High Conservation Levels)</b>										
Billion cu. ft.-----	22,913	22,663	22,716	22,732	22,721	22,654	23,232	24,344	25,545	30,506
Trillion Btu-----	23,620	23,360	23,420	23,440	23,430	23,360	23,930	25,030	26,255	31,280
<b>High Domestic Potential Supply</b>										
Billion cu. ft.-----	22,458	22,188	21,199	22,068	22,214	22,499	23,586	23,981	26,003	18,973
Trillion Btu-----	23,160	22,880	22,680	22,750	22,900	23,200	24,320	24,720	26,810	19,560
<b>Intermediate Scenario Potential Imports</b>										
Billion cu. ft.-----	1,000	1,000	1,000	1,200	1,500	2,350	2,830	3,800	4,700	5,100
Trillion Btu-----	1,030	1,030	1,030	1,240	1,550	2,420	2,920	3,910	4,850	5,260
<b>Total Supply</b>										
Billion cu. ft.-----	23,458	23,188	22,999	23,268	23,714	24,849	26,416	27,781	30,703	24,073
Trillion Btu-----	24,190	23,910	23,710	23,990	24,450	25,620	27,240	28,630	31,660	24,820
<b>Deficits</b>										
Billion cu. ft.-----	-545	-525	-283	-536	-993	-2,195	-3,184	-3,437	-5,158	6,433
Trillion Btu-----	-570	-550	-290	-550	-1,020	-2,260	-3,310	-3,600	-5,405	6,460

## Appendix B

## Summary of Working Papers in Progress in Support of the Project,

United States Energy Self-Sufficiency:  
An Assessment of Technological Potential

The following working papers in support of the energy technology assessment study have been prepared.

1. Wood, Sam and Richard Zaffarano (Bureau of Mines), "Production of Crude Petroleum and Natural Gas Liquids -- Project Independence".
2. Peer, E. G. (Office of Oil and Gas), "Refinery Data -- Project Independence".
3. Ellerbrake, E. G. (Office of Oil and Gas), "Imports of Crude Oil and Petroleum Products -- Project Independence".
4. Wood, Sam and Richard Zaffarano (Bureau of Mines), "Potential Natural Gas Production -- Project Independence".
5. D'Andrea, Lou (Office of Oil and Gas), "Canadian Natural Gas Imports -- Project Independence".
6. D'Andrea, Lou (Office of Oil and Gas), "Alaskan Imports -- Project Independence".
7. D'Andrea, Lou (Office of Oil and Gas), "Nuclear Stimulation of Natural Gas".
8. D'Andrea, Lou (Office of Oil and Gas), "Potential LNG Imports -- Project Independence".
9. D'Andrea, Lou (Office of Oil and Gas), "Potential SNG from Petroleum Liquid Feedstocks".
10. D'Andrea, Lou (Office of Oil and Gas), "Methanol -- Project Independence".
11. Wayland, Russell (Geological Survey), "Obstacles to Leasing Schedules -- Project Independence".
12. Edwards, M. W. A. (Bureau of Mines), "Potential Coal Production -- Project Independence".
13. Edwards, M. W. A. (Bureau of Mines), "Potential Coal Gasification and Coal Liquefaction".



14. Ramsey, Jerry (Bureau of Mines), "Requirements to Promote & Stimulate Shale Oil Development".
15. Schram, Les (Bureau of Mines), "Potential Development Geothermal Resources -- Project Independence".
16. Slatick, Eugene (Bureau of Mines), "Potential Development of Solar Energy -- Project Independence".
17. Dupree, Walter (Bureau of Mines), "Potential Development of Hydropower and Nuclear Power".
18. Seidel, Marquis (Office of Energy Conservation, Federal Energy Office), "Energy Conservation and Energy Demand Curtailment".

FEDERAL ENERGY OFFICE,  
Washington, D.C., March 15, 1974.

HON. RUSSELL B. LONG,  
Chairman, Senate Finance Committee,  
New Senate Office Building, Washington, D.C.

DEAR MR. CHAIRMAN: This is in response to your conveyance of questions by Senator Hartke (from the hearings of your Committee) for which you requested answers by February 8, 1974.

As these questions were not received until February 5, we appreciate your cooperation in permitting us until today to pull the answers to the questions together. In a couple of instances which are noted, the time and staff available on the particular matter still did not permit us to wholly respond, but we are hopeful that the answers supplied are sufficient or that you will notify us and permit more time in which to do such additional work as is necessary to more fully complete the answers in those few instances.

It is a pleasure to work with you, the members and the staff of the Senate Finance Committee with respect to energy matters.

Sincerely,

WILLIAM E. SIMON, *Administrator.*

ANSWERS TO QUESTIONS POSED BY SENATOR HARTKE

*Question 1.* Before considering the institution of any gasoline rationing program Congress needs to know the answers to the following questions:

(a) What are the exact amounts of our proven oil reserves in this country?  
(b) How much will we have to raise the price of crude oil in order to increase the proven reserves?

(c) Does the Administration believe that the oil industry should be allowed to raise prices in order to limit demand for energy products?

Answer 1 (a) The latest estimate available places the total proven reserves of crude oil at the beginning of 1973 at 36,339,408,000 barrels according to the American Petroleum Institute. FEO reporting systems presently being implemented will provide our own estimates in the future on a more current basis.

An exact answer as to reserves cannot be given as Reserve Engineering is not an exact science. Two methods for calculating reserves are generally in use: volumetric or decline curve. Using the volumetric basis, reserves are calculated by the average net thickness of the producing sand under a property multiplied by the acreage of the property to obtain the volume of producing sands (usually expressed in acre feet). If conditions are reasonably uniform, an average value of recovery per acre-foot then is determined, considering such properties of the sand as porosity, permeability and connate water saturation, and such properties of the oil as viscosity, amount of dissolved gas and other appropriate factors. The decline curve method plots current production, calculates the rate of decline and projects the curve to the economic limits of the property based on dollar return. Experts differ on exactness of either process.

(b) The increased activity by drilling rigs is a better measure of the impact of crude price increases on efforts to increase reserves. Since the inauguration of the two-tier system, drilling rig activity has increased after a 15 year decline. Of concern to us is the point at which price increases for crude oil are unable to stimulate increased production because production equipment or labor is not available. Any reduction of crude prices is certain to have an adverse effect on long range planning for development but there is no magic price which will increase reserves. Exploration can be encouraged, as it has been, but exploration alone does not guarantee an increased reserve, especially if present reserves are being diminished faster than new reserves are found.

Geology is not an exact science and no scientific method yet known can absolutely predict and locate oil or gas. The price of oil must therefore include the risk factor. There is no method of predicting what the price of oil should be to increase proven reserves, we do know that increased prices will increase our known proven reserves because they will stretch the economic limit of the property. We also know that when the price of oil compensates the producing segment there is greater drilling activity and when there is greater drilling the chances of adding to our reserves are favorable. It cannot be said for example that an increase in crude oil prices from \$10 to \$20 a barrel will double the proven reserves. In addition to drilling activity, if the price of oil is attractive, there will be workovers of existing wells, and initiation of secondary and tertiary recovery projects all of which improve the recovery of otherwise inaccessible reserves.

(c) The Administration, as indicated in the FEO testimony on S-2885 does not subscribe to the policy of reducing demand for petroleum products by allowing prices to rise unnecessarily. It is, however, our policy to permit price increases to the extent that they reflect increased costs actually incurred. The FEO has in the course of developing its policy and regulations explored many alternative ways of dealing with the energy shortage; by providing incentives to increase supply, by reducing demand through conservation measures, and by allocation mechanisms.

Among the variety of alternatives discussed was the possibility of the ways in which price could be used to curtail demand. As indicated above, these alternatives were not adopted. In terms of our economy and our social structure, the real priorities do not necessarily correspond to the ability to pay higher prices. We are trying to measure the needs in human and national firms, rather than taking the easier path of forcing out that portion of the demand which cannot afford to outbid others.

The FEO is aware that price controls must be administered with a dual purpose and the price rules for the oil industry are carefully designed to maintain a delicate balance between two objectives:

(1) allowing the energy industry pricing flexibility to attract the capital necessary to develop additional energy resources and to tap higher-cost sources on one hand and

(2) preventing emotional price increases that are wholly unproductive and inflationary on the other.

*Question 2.* On December 19, 1973, the Senate passed S. 2776 (The Federal Energy Emergency Administration Act). In this bill there is a provision calling for a national study to investigate the degree to which any person, partnership, corporation, or other organization is stockpiling in addition to ordinary and necessary requirements, more fuels, of all types, than he requires to meet his reasonable needs. This is Section 112 of the Senate version of the bill.

(a) Could you tell me if you have taken any action on this matter of hoarding?

I understand from the press that you have investigated hoarding irregularities in the trucking industry. Could you reveal the results of your investigation? If you have not completed it, could you provide me with a status report on your activities in this regard?

(b) Has your office taken any actions to prevent the undue stockpiling of fuels?

(c) Does your office have any rules, regulations or policies governing stockpiling at the present time?

*Answer 2.* The system of reporting required by the mandatory petroleum allocation regulations, published on January 15, 1974, is designed to provide an effective monitor of the several petroleum products held in storage by the reporting entities. These regulations, promulgated in accordance with the Emergency Petroleum Allocation Act of 1973, do not specifically refer to "hoarding." However, through monitoring of the required reports and investigation of substantial referrals and complaints relating to "hoarding," FEO is attempting to restrict the occurrence of unauthorized excess storage of allocable petroleum products.

Pursuant to the regulations (10 C.F.R. § 211.11), a supplier is required to report any surplus product in excess of that product needed by the supplier to fulfill the supplier's allocation requirements. The FEO National Office is then authorized, by regulation, to direct other distribution of the reported surplus. The present regulations, in effect, restrict inventories of petroleum products above and beyond normal use.

FEO has made an initial inventory survey of some thirty-two major truck lines to determine the inventory practices in the trucking industry and also to determine substantial increases in on-hand supply of these trucking companies. The results of the initial survey did indicate that on-hand and on-order supplies were greater on January 4, 1974, than a year earlier. However, the information, at this point, does not reflect "hoarding irregularities in the trucking industry" as your question suggests. FEO is continuing its examination of the fuel inventory of the trucking industry to determine optimum inventories and also to establish what inventory limitations may be feasible.

Although numerous rumors of illegal stockpiling have been circulated, investigation of those cases in which substantial leads have been available have established only scattered instances of illegal excess storage. FEO will continue to investigate concrete reports of stockpiling with the rate increasing as the investigative and enforcement manpower increases. FEO is also determining the possibility of additional regulations restricting excess storage and stockpiling.

As Mr. Simon recently announced, FEO is determining appropriate inventory levels of truck lines buying in bulk quantities considering 1972 average inventory levels as compared to historical usage. This action will prevent illegal stockpiling of fuel in the trucking area and will assure industry wide equity in fuel availability. FEO's Refinery Audit and Review Program will monitor established inventory practices at other levels, including producer, refiner, and wholesaler, to prevent excess storage in violation of the mandatory petroleum allocation regulations.

*Question 3.* Does your office have any indication that there are any irregularities in the export and then immediate import of domestic oil supplies in order that the oil industry can avoid price controls which are placed on domestic oil?

(a) I understand that domestic oil is shipped abroad and then mixed with a lower sulphur oil and then brought back to the United States. For sale purposes in the U.S., is this oil considered imported or domestic, i.e., does it fall under the price control guidelines set-up by the Cost of Living Council?

Answer 3. There are periodic charges that domestic products are being exported and then imported to avoid price controls. These reports are investigated by the Internal Revenue Service and to date have not been verified. There are obvious economic disadvantages to moving products back and forth such as tanker rates and pipeline tariffs, dockage expenses, etc., which would tend to prevent this in any sort of competitive market. Export statistics certainly do not indicate that there is any widespread export of domestic crude or products beyond that to historic customers and that there has been any appreciable increase in exports which remain only a very small fraction of U.S. production. A recent study on heating oil exports is attached and demonstrates the small volumes of product involved. If crude oil is exported and mixed with other crude to lower the sulphur oil, the mixing would be considered to have materially altered the crude and price control regulations would apply after the first sale into domestic commerce.

#### HEATING OIL EXPORTS—A STUDY PREPARED BY THE ENERGY DIVISION, OFFICE OF PRICE STABILIZATION, COST OF LIVING COUNCIL

##### HEATING OIL EXPORTS

###### *Summary*

The available statistics combine No. 2 heating oil, No. 4 heating oil and light diesel fuel, all of which are categorized together in the U.S. Government Schedule "B" of Classifications. Statistics for No. 2 heating oil are not segregated, within the Schedule "B" Classification.

The Comparative Analysis includes:

- (1) Domestic distillate production
- (2) Volume of distillate exports
- (3) Sales value of exports
- (4) The average price per barrel of exports
- (5) Port of export
- (6) Destination

The available statistics do not segregate exports which return to the United States after foreign processing.

Federal Regulations do not allow U.S. Census Bureau, the agency responsible for this information, to divulge the identity of the firms involved in these transactions.

The export statistics from 1969 through August 1973 were included in this report in order to compare the 1973 projection to historical data.

An analysis of the available data reveals:

(1) That although projected 1973 totals will more than double 1972 totals, a comparison including the historical base reveals that 1972 was a depressed year in volume of barrels.

(2) That since 1972 was a depressed year in volume, the 1973 increase as compared to 1972 appears to be a return to an historical export level.

(3) That since 1973 volumes do not exceed historical volumes, while 1973 prices do, the 1973 volume appears to be a continuation of transactions with an historical foundation.

(4) That distillates amount to approximately 22% of the U.S. refinery production and that our annual export totals during the period studied range from .04% to .2% of the distillate production.

(5) That each of the annual distillate export totals for the period studied are substantially less than an average day's consumption of distillates in the U.S.

*Analysis*

The following is a tabulation of distillate export volumes from 1969 through August 1973 and a projection for the entire year 1973.

Year	Volume (barrels)	Total value	Average per barrel
1969.....	1,859,825	\$6,567,645	\$3.53
1970.....	1,444,525	4,329,902	3.00
1971.....	1,858,471	7,909,468	4.25
1972.....	448,433	1,797,960	4.01
January-August 1973.....	850,067	4,934,185	5.80
Projection, 1973.....	1,275,101	7,401,278	5.80

## PERCENTAGE RELATIONSHIP OF 1973 TO EACH OF THE PRECEDING YEARS

1973/1969.....	69	113	164
1973/1970.....	88	171	193
1973/1971.....	69	94	136
1973/1972.....	284	412	145

## THE MONTHLY VOLUME FOR JANUARY-AUGUST 1973

Month	Volume (barrels)	Average price per barrel
January.....	256,618	\$5.01
February.....	22,495	6.66
March.....	4,429	3.95
April.....	123,012	6.05
May.....	5,586	4.43
June.....	196,928	5.80
July.....	40,926	5.44
August.....	200,073	6.73

## PERCENTAGE RELATIONSHIP OF THE EXPORT VOLUMES TO DISTILLATE PRODUCTION

Year	Export VOL barrels	Percent of total distillates production	Average Percent distillate of refiners production
1971.....	1,858,471	0.2	22.05
1972.....	448,433	.04	22.21
January/June 1973.....	609,068	.1	22.30

## DESTINATION AND PORTS 1973 EXPORTS

Month	Destination, port	Volume barrels
January.....	Mexico from Galveston, Tex.....	60,346
	Netherlands, Antilles from Galveston, Tex...	195,812
April.....	Mexico from Galveston, Tex.....	113,647
	Denmark from Port Arthur, Tex.....	.....
June.....	Mexico from Galveston, Tex.....	128,695
	Japan from Seattle, Wash.....	60,000
August.....	Panama from Port Arthur, Tex.....	49,228
	Denmark from Port Arthur, Tex.....	148,221

Since our average consumption of distillates is 2,730,000 barrels daily it is readily apparent from the foregoing export statistics that we are discussing a volume that is more than 800,000 barrels less than our average daily consumption.

*Question 4.* I am quite concerned by the number of former oil industry executives who work in your office. A policy of hiring oil industry people seems to raise the issue of conflict of interests. In many cases, these individuals will work for your office after several years in the industry and then most likely return to the industry after their employment with you. This kind of interchange is suspect in the eyes of the public.

(a) How many former oil industry people do you have working in your office? In what capacities?

In your announcement of January 17, you state that Melvin Conant had just been appointed Deputy Assistant Administrator for International Trade and Commerce in the Office of the Assistant Administrator for International Policy and Programs. Mr. Conant most recently served as Senior Government Relations Counsellor for the Middle East and Asia for the EXXON corporation. He served with EXXON for 11 years and previous to this he served as Regional Political Advisor for Standard Oil interests in East Africa, Asia, the Far East and Australia.

(b) Are you following a deliberate policy of hiring professionals from the oil industry? If so, why?

Answer 4(a). At the present time, there are fifty-eight former oil industry people employed within the Federal Energy Office. Forty-seven of them are employed in Washington, D.C., and eleven are employed in the regions. As of February 4, 1974, there were 1004 Federal Energy Office employees (including detailees) in Washington, D.C., and 1026 employees in the ten regional offices (ninety-three really work in state offices).

These people are employed in the following capacities, but there are a few whose actual job titles are not yet known.

Assistant Administrator, Office of Policy, Planning and Regulation.

Deputy Assistant Administrator for Policy Analysis.

Deputy Assistant Administrator for Trade and Commerce.

Acting Director for Program Planning.

Acting Director for Office of Energy Statistics.

Chief, Industrial Systems and Data Analysis.

Acting Chief, in Office of Policy, Planning and Regulation.

Deputy Director of the Office of Producer Country Affairs and Emergency Supplies.

Assistant Director for Voluntary and Mandatory Programs.

Acting Assistant Director for Program Planning.

Director, Office of Regulatory Review.

Industrial Specialists—total of sixteen.

Fuel Manager, General Fuels.

Program Analyst—Residual Fuel.

Acting Fuel Manager, Crude Oil and Petro-Chemical Allocations.

Distribution Specialist—two.

Economist—three.

Consultant—two.

Case Resolution Officer—three.

Attorney, Price and Tax Policy Division (job title not known).

Refinery Specialist.

Trade Specialist.

Mechanical Engineer.

Engineer.

Presidential Interchange Program employee—title not known. Working in Office of Deputy for Analysis.

Special Assistant.

Staff Assistant.

Administrative Assistant.

Secretary.

Aide, Office of Gas Rationing.

Several of these people haven't worked for oil companies for many years, and some have held other government positions prior to coming to the Federal Energy Office.

Finally, in view of the fact that the data was rapidly compiled in order to respond to the questions in the time permitted, the data, particularly from the field offices, has not been verified. However, we are undertaking a verification as well as a check of the comprehensiveness of the information submitted at the present time.

4(b) The FEO does not employ "a deliberate policy of hiring professionals from the oil industry." It is the policy of the FEO to fill its professional positions with individuals who we believe are best qualified to perform the duties each position entails, so as to serve the public interest.

*Question 5.* The posted price per barrel for Saudi Arabian light crude oil is \$11.65. This is the price which is used to determine taxes and royalties. It is an artificial price.

Actual tax and royalty payments amount to \$7 per barrel. There is a production cost of 15¢ per barrel and company profits equal 50¢ per barrel. Transportation costs to the United States are \$2 per barrel. This brings the actual market cost of a barrel of Saudi Arabian crude to \$9.65.

(a) Has your office devised any method for determining just how much of that \$7 figure is royalties and how much is taxes?

The Arab countries usually call the whole figure a tax and Federal tax regulations make no effort to try to define what is a royalty and what is a tax. Taxes and royalties used to amount to \$3.05 per barrel, then were raised \$3.95 to \$7 a barrel. Because all of this is considered a tax, this entire increase is a tax credit for the oil companies and the consumer must pay not only the increased price per barrel, but also must pay for the increased tax subsidy which comes in the form of a credit.

In addition, if the "tax" were a royalty, it would be deductible from the oil companies gross income before figuring the depletion allowance. If the "tax" is a tax, then it is not deductible and therefore the depletion allowance is higher.

Answer 5. The method for determining the amount of royalties and taxes which must be paid to Saudi Arabia and other members of OPEC (Organization of Petroleum Exporting Countries) is fixed by agreement among the member countries. In the case of the \$7.00 figure, royalties comprise \$1.45 and taxes amount to \$5.55.

Industry estimates vary as to the cost of transportation from the Persian Gulf to the United States. Shipping costs depend upon the conditions which cover each shipment. These may range from transportation in company-owned vessels to long-term charter agreements to spot tanker rates. An average used by FEO is World Scale 100 corresponding to approximately \$1.50 per barrel for a voyage from the Persian Gulf to the United States. However, a large percentage of the crude petroleum transported on this route is carried at rates considerably lower than World Scale 100.

A question could also be raised concerning the figure of \$0.50 which has been designated as company profit. This figure can be more accurately described as pricing differential which the producing company adds to its tax costs. The differential equates to the difference between tax costs and the amount which the producing company would be able to realize if it sold the crude petroleum to another oil company. The validity of these pricing differentials and transportation costs are two elements which are being checked closely under the FEO's Refinery Audit and Review Program.

Senator DOLE. The next witness will be the Honorable John Nassikas, Chairman of the Federal Power Commission, and I might say, Mr. Nassikas, in the absence of the chairman, you can proceed in any way you wish, either read the total statement—it will be made a part of the record in any event—summarize your statement and respond to questions, or however you wish to proceed.

**STATEMENT OF HON. JOHN N. NASSIKAS, CHAIRMAN, FEDERAL POWER COMMISSION; ACCOMPANIED BY EMMETT J. GAVIN, ASSISTANT TO THE CHAIRMAN; HASKELL P. WALD, CHIEF, OFFICE OF ECONOMICS; WILLIAM B. O'NEIL, ECONOMIST, OFFICE OF ECONOMICS; WILLIAM J. POWELL, CHIEF, DIVISION OF SYSTEMS, OFFICE OF ACCOUNTING AND FINANCE; GORDON K. ZARESKI, CHIEF, PLANNING AND DEVELOPMENT DIVISION, BUREAU OF NATURAL GAS; AND ELLIS R. BOYD, GENERAL ENGINEER, PLANNING AND DEVELOPMENT DIVISION, BUREAU OF NATURAL GAS**

Mr. NASSIKAS. Mr. Chairman, I will be happy to summarize my statement and simply offer it for the record.

The Energy Revenue and Development Act is a comprehensive legislative program with the purpose of achieving energy independence

for the United States. I share the objectives of the act. As I have stated for almost 4½ years now, that the Nation should strive for energy self-sufficiency. This is not a new theme with me. My first articulated statement before a congressional committee on this score was in November 1969, before the Senate Interior Committee.

The next major statement, which I have cited in my testimony, was a separate statement that I filed as a member of the Cabinet Task Force on Oil Import Controls in January 1970. I dissented from that particular task force report because I did not believe that the findings of the majority in any way recognized the fundamental problem that we must strive for domestic energy self-sufficiency to avoid the kind of disaster which we are now confronted with as a result of the Arab and other OPEC nations' embargoes.

Furthermore, as I stated in my prepared statement, it is not only the OPEC nations of the Middle East which have raised prices or which have tried to exercise economic sanctions. Venezuela, one of the OPEC nations, has also dramatically increased the price of its crude oil exports, both to Caribbean refineries and to Canada. Some of this oil then is transshipped in the form of No. 6 residual fuel oil, which is the primary fuel source for about 90 percent of our electricity North of Washington, D.C. Finally, because of the impact of these increasing prices upon Canada, and because of other relationships, Canada has substantially increased its export prices for natural gas very recently. I will discuss this last problem later in my statement.

With respect to LNG imports, at pages 4 to 11 of my statement, I have summarized the Nation's import situation. I might point out there is one paradox of our current energy dilemma that I was not responsible for. I may be responsible for other aspects for which I will take full credit, but one of these I have cited is the LNG export by Phillips Petroleum, which was authorized in 1967 by a predecessor Commission, of about 50 billion cubic feet of gas per year which is sold to Japan at somewhere around 55 cents per 1,000 cubic feet.

Just to give you some idea of how much gas 50 billion cubic feet is, this is about one-half of the annual sales volume of the Washington Gas Light Co., which is one of our largest gas distributors in the United States, serving this metropolitan area.

The LNG imports that we have authorized have been largely peak shaving quantities. Smaller amounts of liquefied natural gas that we consider as baseload for an importing pipeline have also been authorized. My recollection of the figures is that about 2 billion cubic feet annually might be coming into the United States in the form of liquefied natural gas. Pipeline imports from Canada are slightly in excess of 1 trillion cubic feet annually, or about 4 to 5 percent of our total gas supply in the United States. Mexico has very limited pipeline exports, which are sold only to one interstate pipeline gas company.

We did, however, clear a major LNG project last year, the El Paso project, which involves imports to the east coast of the United States, largely to the Columbia Transmission Cos., the Southern Energy Co., and Consolidated Natural Gas. These imports, over the period of 25 years, would involve a volume of about 9 trillion cubic feet.

We have a further El Paso application pending that we have not acted on. The volumes involved in both of these projects total about 18 trillion cubic feet.



LNG, in my opinion, is a necessary supplement to our diminishing domestic natural gas supplies in the United States.

I have not documented the natural gas in this particular statement, having recently documented it last week before the House Select Small Business Committee. I might refer you to that, but I would be happy to answer questions on the shortage.

In a nutshell, in the last 5 or 6 years we have used twice as much gas as we have found. Also, until last year our drilling effort for natural gas, both in developmental wells and exploratory wells, had declined from the peak that was reached in 1961.

Oil exploration peaked in the United States in 1956. Oil exploration and development regrettably is still lower today. It has declined over the course of the past 4 or 5 years. Natural gas drilling on the other hand has responded to various policies of the Federal Power Commission and perhaps others, governmental policies, too, by turning around a decline, an almost constant decline in exploration and developmental drilling since the peak of 1961 to a level about 30 to 35 percent higher from the standpoint of wells drilled, exploratory, and development, and footage drilled. So I am somewhat encouraged, but only slightly, by the turnaround in drilling in response to some of the Federal Power Commission's policies of the past 4½ years.

I should point out, as I do at page 14 to 15, that the leasing program that has been the policy of the U.S. Government over the past decade has been most inadequate. We have leased about 8 or 9 million offshore acres of land, which is roughly 2 percent of the Outer Continental Shelf. In the last 2 years the leasing effort has accelerated and we have leased several million acres. Two major sales were held in September and December of 1972, finally another large lease sale in the Gulf of Mexico in June of 1973.

This relates to the natural gas shortage, and also to the crude oil shortage in the United States, because the prolific prospects for oil development and gas development and drilling were not made available in the quantities necessary over the course of the past 10 years to meet the incremental demand for oil and gas. Especially as to natural gas, we cannot expect a response to a higher price if the prospects are not made available.

That would be a self-defeating energy policy, an increased price for less gas or an equal amount of gas. I can document this in terms of elasticities to give you marginal costs, but I do not see any need for it right now.

Alaskan gas is, of course, one of the saddest epics in the energy history of the United States. We have delayed 5 years now in building a necessary pipeline to transport oil to the Lower 48 States. And until that pipeline is built, the natural gas volumes of about 26 trillion cubic feet of known reserves at Prudhoe Bay cannot be developed, marketed, and delivered to the Lower 48 States, either completely by pipeline or on an alternate basis by a pipeline across Alaska and a liquefied natural gas facility in a tidewater port on the west Alaskan coast, with transshipment to the west coast of the United States.

To repeat, the 26 trillion cubic feet of gas in Alaska is associated gas. Until the oil is developed the associated gas cannot be delivered to the Lower 48 States. Twenty-six trillion cubic feet is a block of gas that is larger than the entire domestic production of gas in the year 1973.

Incidentally, on that score, oil production in the United States reached a peak in 1970. Gas production still has not peaked out. Gas production, as is demonstrated by the figures of production, has gone up slightly in the United States. And it has been supplemented by increasing imports from Canada and some liquefied natural gas imports.

More gas is being produced in the United States today than was produced in 1970.

Senator DOLE. How can you explain the increased production in face of the failure to deregulate the price?

Mr. NASSIKAS. Well, the increased production, of course, has been responsive to demand, and even though the price has not been deregulated by an act of Congress, we have established some incentive policies at the Federal Power Commission, increasing prices over very vociferous protests by various groups in all areas of the United States in the past 4½ years.

When I came to the Federal Power Commission on August 1, 1969, the new-gas price that had been established by the previous Commission at that time was somewhere around 18 cents. Well, the new gas price may not seem very large in terms of today's prices for alternate fuels, but we did increase the level of new-gas prices under our area rate proceedings in all areas in the United States with the exception of the Hugoton and Anadarko area, which was a special situation, to about 25 to 26 cents, under our area rate concept.

We also released small producers, who are selling under 10 billion cubic feet of gas annually, from price restraints over 2½ years ago.

Some of these actions are now pending before the Supreme Court. Nevertheless, over the course of the past 2½ years, small producers have not been charging the ceiling price for gas that we have imposed on other producers.

Other very important incentives that we established, apart from our increased area ceilings, are limited-term certificates with pre-grant and abandonment, that is, 1- to 3-year sales, and 60-day emergency sales. These emergency certificates have now been expanded to 180-day sales, and the Supreme Court recently vacated two stays of our order that were granted by the Courts of Appeals of the District of Columbia, so the 180-day emergency situation applies.

Under these measures we have attracted in excess of a trillion cubic feet of gas to the interstate market. It is pushing to about 1½ trillion cubic feet of gas at higher than the 26-cent price. The average price of such new gas is not 45 cents. It is far lower than 45 cents. I could document that for you and would be happy to submit a supplementary statement, if you so request.

Senator DOLE. I wonder, then, if you have been able to accomplish all this without any statutory deregulation by the Congress? Do you think you can—

Mr. NASSIKAS. No, no; and I will tell you why. What we have accomplished I do not want in any way to be considered as a solution to a devastating gas shortage in the country. One computation which I have set forth, either in this statement or in the House Select Committee statement, is basically that we are adding reserves annually now on an average of about 10 trillion cubic feet of gas. In order to meet a modest projection in demand through the year 1985, we should be adding annually to the reserves, in addition to all supplements—

and I can give you the assumptions on the supplements also—but adding to domestic reserves of gas, 37 trillion cubic feet of gas annually. That is more than 3½ times the level of reserves that we are now actually adding.

Now, the largest quantity of reserves that were ever added in a single year to our gas reserves was 37 trillion cubic feet in 1970, of which Prudhoe Bay accounted for 26 trillion cubic feet. Yet, this is lying fallow because we have not developed the oil pipeline that must precede development of the gas.

The second largest reserve addition was in 1956, I believe, in which a volume of gas of about 25 trillion cubic feet was added. So I am saying that we have to add into domestic reserves 37 trillion cubic feet of gas annually to meet future gas demand in the country. And in that assumption I include supplementary gas, shall we say from Canada and Alaska, by the year 1990 in the range of 4.2 trillion cubic feet, plus liquefied natural gas imports by 1990 on the order of 4 trillion cubic feet; and over and above that, through the gasification of coal, another 3.3 trillion cubic feet.

This is the task that we have, within the constraints of a consumer protection statute that Congress enacted and delegated the responsibility to us to execute. We have done about as much as we are capable of doing within the limits of our legal power.

I have urged Congress time and again, if it does not enact deregulation, to give the Federal Power Commission authority to establish gas rates on the basis of market factors, commodity value, and economic conditions, and not simply on the basis of cost evidence, which is the way the courts, including the U.S. Supreme Court, have interpreted the Natural Gas Act.

Our optional pricing procedure, which attempts to utilize criteria other than cost evidence to establish prices, has been assailed in the courts. That decision is still waiting to be decided by the Court of Appeals of the District of Columbia. It has been there a year, and we still do not have a decision, so we do not know at this time whether or not that particular procedure will be sustained.

Why do I raise that? Because any time there is a legal appeal of a basic structure established by a regulatory agency, there is uncertainty. And when there is uncertainty, there is not a commitment. Basically, I believe that we should deregulate new gas, that the Congress should pass an act deregulating new gas, and define carefully as it is defined basically in this bill, that we should nevertheless retain the authority to review the providence of purchases by pipeline companies of their gas so that, in the absence of some other standard we still could provide some protection to consumers from prices that would impact upon deregulation.

Now, while I recognize—and I have said this time and again, too—that it may take 5 to 7 years, not just 3 or 4 years, before there is much impact from the deregulation of Gas, nevertheless, there would be an immediate impact of new dedications to the interstate market (as defined in this bill and the administration bill) when contracts expire and then they seek the so-called market clearing level for new gas in competition with other energy supplies.

There are three tests that you use in your bill, and this feature is also in the administration bill. One is wells commenced after a certain day. Second, upon expiration of existing contracts, any gas that

remains, not subject to the abandonment jurisdiction of the Federal Power Commission, gets the new price. Then third, new dedications to the interstate market, where the gas may have been flowing but was never dedicated under a contract to the interstate market, but might have been in the intrastate market, then that gas also gets the new price. So that is a summary of what I have said on gas deregulation.

Senator DOLE. Could I touch on the so-called Stevenson bill, which is an effort to regulate intrastate?

Do you now have any jurisdiction in that area?

Mr. NASSIKAS. We do not, and I do not advocate it, Senator Dole. I do not think we should expand the jurisdiction of the Federal Power Commission to regulate intrastate gas. I think that is going in the wrong direction. I do not think that increased regulation by the Federal Power Commission is going to establish pricing policies and regulatory policies that will enable the drilling effort to be accomplished that I mentioned earlier, the 37 trillion cubic feet of gas added annually over the next decade to the gas stream.

Senator DOLE. Do you have any jurisdiction, or do you need jurisdiction in certain emergency conditions?

I can recall in my State 6 weeks ago that two school systems were on interruptible contracts, and gas service was stopped. A CBS newscast featured the children going to school with their coats and mittens.

Is there any authority you have to provide natural gas in these emergencies? Where there is a shortage of natural gas, the first customers to lose that service were those with interruptible contracts, and in this case it happened to be two schools, one in Paola, Kans., one in Oswatomie. We checked with the supplier, Panhandle Eastern Gas Service Co. The State agency in this case said they had no authority—and apparently they did not, Panhandle did not have the gas.

So is there anything that we can do under these emergency conditions?

Mr. NASSIKAS. I do not know whether Panhandle Eastern was the supplier. We are the sole source of supply in the distribution company out there.

Senator DOLE. They were the supplier. Distribution was by the Gas Service Co.

Mr. NASSIKAS. We do have jurisdiction. The Supreme Court has affirmed that.

Senator DOLE. There is also the same problem in Michigan, and it has occurred in other States, and it probably will again if we have a cold wave. Anyone on an interruptible contract is, of course, subject to almost immediate discontinuance.

Mr. NASSIKAS. We have authority, and we have set up national curtailment plans and also specific pipeline plans for six or seven pipelines already. After all, some of the largest pipelines in the country are in curtailment, and they supply about 52 percent of the total volumes nationally. They are in curtailment. United Gas is in curtailment by about 30 percent; Transco by about 10 to 15 percent. Transco supplies, of course, the Eastern market and the New York market. Texas Eastern is in curtailment. It supplies the Eastern market, and then, ultimately up to New England through the Algonquin Co.

We have jurisdiction to allocate supplies among end-users of gas. But we cannot direct, for instance one pipeline that may have reserves of gas to transfer their gas supply to another pipeline company that may be short. There are limitations on our jurisdiction as to allocations. But we have no jurisdiction, of course, over any solely intrastate sources to allocate intrastate sources of gas to needy areas.

I believe that the pipeline industry itself through various exchange agreements that we have worked out, quite effectively in some areas of the country, can cope with this problem. This is better I believe than to get into some type of a rationing legislation in addition to our 180-day emergency situation. This not only authorizes gas to be delivered to our interstate pipelines apart from price restraints, subject to review by the Commission, but also authorizes exchange agreements between pipelines to try to meet the kind of situation that you have raised, Senator Dole.

Senator DOLE. In this case, of course, Panhandle was very anxious to be of assistance, but because of curtailment they had no options. But I raised the question again in the broader sense because I found—and I think my State is fairly representative—a suspicion about the oil or gas shortage. You can always find examples of at least where people believe that certain things are being done, either by Government or by industry, that would indicate the contrary.

It just seems to me that, if we are going to get on top of the energy problem or crisis or whatever, we have to have the confidence of the people. They are looking for solid leadership and, I think, frankly, that thus far it has been mixed. There has been a lot of gas and not much leadership. So perhaps, for the record—I know your feelings and I know of your conviction—but how do I project this to the parents, say, of these schoolchildren who could not understand it, or anyone else who has a problem? The city of Wichita, now is threatened by a natural gas shortage. And this is just in my State, and you can multiply the examples across the country.

Mr. NASSIKAS. Well, to convince the American people that there is, in fact, a natural gas shortage still presents a problem. I think that the only way to continue to try to persuade the American people that there is a shortage is to hold hearings of this sort. I might also mention public statements by accountable officials like myself, my colleagues on the Commission, and independent studies of gas reserves such as the Federal Power Commission has undertaken which document that, as of 1970, there was 10 percent less gas in reported reserves than was in fact reported by industry associations.

This was the first independent study of natural gas reserves or any kind of petroleum reserves undertaken in the United States covering proved reserves that are deliverable to market. This was done. The report was issued in May of 1973. It was a 1½ year study.

We have also conducted studies of uncommitted gas reserves. That is, what is the extent of gas reserves that the producers might have available that they have not committed under contract? Is there withholding of gas supply? Well, this has been a very controversial subject over the course of the past 4 years. The four studies that we have conducted indicate that the level of uncommitted reserves is, in fact, a very small percentage of the total gas reserves, and it is a declining amount that we show—somewhere below 3½ trillion cubic feet out of total proved reserves of perhaps 285 trillion cubic feet.

Our later study asked for public reports of uncommitted reserves. We have not yet issued our decision, but this is ripe for a decision at this time.\* We proposed that any uncommitted reserves that are reported by producers will then be publicly noticed by the Federal Power Commission so that the information would be in the public domain.

Well, out of some 85 respondents whom we asked to file this information, in effect only 3 have declined. An issue is pending before the Commission as to whether we will direct those three to file this information.

Now, it seems to me that the credibility question as to whether there is a shortage is not even close. It strikes me as a disservice so far as natural gas is concerned for unsupported allegations to be made that there is an abundance of natural gas that is just waiting for a price to meet the market. If any Government agency has that kind of evidence, it should be reported to me as Chairman of the Federal Power Commission. If any consumer group has that evidence, it should be reported also, so that we then might be able to determine where we might find gas.

I have not been able to find it. Our staff has not been able to find it. And I would like to tell the American people as I constantly do that there is a natural gas shortage, and that they should not be engaged in a crisis of faith, that they should have faith in accountable Government officials and what we are trying to do 14 hours a day.

Senator DOLE. I think, until we have reached that point, or can overcome this crisis of faith, as you so well put it, there will continue to be problems. There are just millions of Americans who feel that when the price is high enough, the supply will be plentiful enough.

Mr. NASSIKAS. Obviously a higher price will induce a further exploration and development effort. The simple laws of economics will dictate that. But this does not mean that a higher price will instantly commit to the interstate market reserves that are available.

Let me give you our experience under the 180-day emergency program that really started about the middle of November in order to cope with the coming winter crisis due to natural gas shortages. So far we have committed under that program at an average price of about 51 cents—with many prices in the medium range and some that are way below that in the thirties—somewhere around 200 billion cubic feet. It is not quite that; it is 150 billion cubic feet. My 200 billion figure is quite accurate if we add, though, almost 50 billion cubic feet of gas committed under the so-called 60-day emergency sales that dovetail with this; it is close to 200 billion cubic feet, at an average price of around 51 cents to 53 cents at the current reading.

Now, if there were enormous reserves simply waiting to be delivered to market, I would think that there might have been a response to our 180-day emergency provision and that these reserves would have been delivered to market, because we are competing here with intrastate prices, competing with wherever there is a demand for gas. Our experience shows otherwise.

The only part of my statement that I would like to expand on is my position as to gas deregulation that I have set forth here on page 22 of my statement.

\*The decision was subsequently rendered and is printed in this hearing following Mr. Nassikas' prepared statement, p. 1235.

Section 502 of S. 2806 would decontrol new gas except for sales by producer affiliates and pipelines and would grant sanctity of contract to all rates previously determined to be just and reasonable by the Federal Power Commission.

I have endorsed sanctity of contract provisions for over 2 years. I wish such legislation had passed. We could have liberalized our regulatory policies more than we did if we had had that permission from Congress. We did not get it.

Section 502 (e) and (f) of S. 2806 would amend sections 4(e) and 5(a) of the Natural Gas Act so as to preclude Commission review of the reasonableness of pipeline purchases of gas exempted under the proposed section 1(b) and our denial in whole and part of the cost of these pipeline purchases in excess of reasonable costs, except as to the prices paid to pipeline affiliates which exceed those received by non-affiliates. Thus such changes would afford no regulatory protection to the ultimate consumer, and I, therefore, oppose those amendments, even though I support the deregulation of new gas prices.

Now, if somebody can come up with a substitute and a standard written into this act which will enable the price to reach a level that is not going to create some windfall profits, I certainly would be pleased to review that kind of an approach.

Unlike the administration's decontrol bill, S. 2048, there is no provision for monitoring prices and reimposing price controls. I believe the Federal Power Commission should be vested with responsibility to monitor the efficacy of new gas deregulation. And I noted from Bill Simon's statement this morning that apparently the administration, through Bill Simon, is now recommending this. I recommended this from the outset.

Senator DOLE. Well, I think, in fact he had a one-sentence comment covering that. And I assume, again, it is for the protection of the ultimate consumer.

Mr. NASSIKAS. It is, and I certainly endorse it. This is what I have in my statement. We should report to Congress what our experience is with volumes that are dedicated, with prices—

Senator DOLE. Do you concern yourself with profits of gas producers?

Mr. NASSIKAS. We concern ourselves with profits but we do not regulate—

Senator DOLE. The headline yesterday was, Exxon profits—

Mr. NASSIKAS. We do not regulate gas producers on a company-by-company basis. We are concerned, nevertheless, with the profits of gas producers insofar as the basis of our determination of area rates is based on costs; also, insofar as exceptions from our area rate determinations are allowed for new gas supplies that are dedicated to the interstate market under cost of a supply project, so to speak, under optional pricing; or in establishing what we believe is a fair rate of return on investment for all producers on average.

Senator DOLE. Have you found any cases, say, in 1973 where there has been what are being referred to as excess or windfall profits by any producer?

Mr. NASSIKAS. We do not, as I stated earlier, examine on a company-by-company basis whether they, in fact, on their total gas operation are making excess profits. This is not done by the Federal Power Commission.

Senator DOLE. But you do consider the profits in setting rates?

Mr. NASSIKAS. In our rate determination, what the likely profits are.

Senator DOLE. Oh, I understand.

Mr. NASSIKAS. All right.

Then I also believe that it should be clearly written into a statute that there should be rigid enforcement of antitrust laws by the Justice Department and by the Federal Trade Commission to assure the justness and reasonableness of market determined prices under workably competitive conditions.

If Congress does not adopt the option of deregulation for some reason—I hope you do; I hope you deregulate in this 93d Congress, tomorrow; this is when I would like to have you do it.

Senator DOLE. We cannot do it tomorrow.

Mr. NASSIKAS. I know you cannot. Maybe the next day, Senator.

But, anyway, if Congress does not adopt the option of deregulation to allow the impersonal forces of the marketplace to regulate new gas supply and demand, and believes that deregulation must include authority to reimpose controls during the time required to dedicate new supplies to the interstate market, the 5- to 7-year period that I mentioned, then I would recommend that the Federal Power Commission, under some identifiable standards, be granted the authority and responsibility to reimpose controls.

Here again I hasten to add I would prefer to see deregulation without authority to reimpose controls by a Government agency, because it is self-defeating to have the specter of reimposition of controls hanging over the head of industry that has dedicated hard money to an exploration and development effort.

If it is decided to continue regulation of natural gas, I would not urge any expansion of our jurisdiction over intrastate. I would, however, urge, as I say on page 25, that we should be allowed to depart from the dictates of historic cost-based pricing in setting price levels for both new and old gas and to be expressly empowered to determine reasonable prices based on commodity value, price of alternate fuels, and economic and market factors in addition to cost considerations, which, incidentally, are essentially the same criteria which would govern the reimposition of controls as recommended in the administration's bill. If these criteria are valid for the reimposition of controls, then they should be valid in determining market prices if we have continued regulation, which I do not urge.

Senator DOLE. I appreciate your comments in addition to your summarization of your statement, which will be included, of course, in full in the record, as you know.

I have two or three questions that I think Senator Gravel would be interested in, and one that concerns all of us.

If we have this current trend in gas production and consumption, if the same trend continues in both areas, what will be the consequences for the area of, say, New England and the upper Midwest 5 years from now? Rosy?

Mr. NASSIKAS. Very grim. We have to develop new gas supply in the United States in addition to all of the supplementary sources that we have, as I said earlier. We have to do this; we also have to turn around our domestic oil exploration and development program and



develop more crude oil, and, of course increase the refinery capacity in the United States.

Many exploratory efforts, if not most, are joint. You are searching for hydrocarbons. When you are searching for oil, you might find gas. Sometimes you surprise yourself and you go out and try to find gas and you find oil, and vice versa.

So that New England, for instance, is really relying on imported No. 6 residual fuel oil for 90 percent of its power generation. That is part of their energy economy. New England is reliant on it. Algonquin, which supplies southern New England up to Boston, proposed on one reformer gas project, which we have cleared—that is, as to the purchase, although we declined jurisdiction over the reformer gas manufacture from naphtha. That project, as certified was at about \$1.85 a million British thermal units. That would compare with natural gas delivered by pipeline from, say, south Louisiana, Appalachia or any place else, to the New England market, at a delivered price of about 65 to 70 cents, a little more than one-third the price of the reformer gas. Still, we believed that the public interest warranted the project because it was a source of gas that could be made available in a rather short leadtime.

The liquefied gas projects, like the Distra gas project, which has a terminal in Revere, Mass., and another one proposed in Providence, R.I., tied into the Easco gas project in the latter area, would propose to bring in gas from Algeria. We issued a conditional certificate at an initial base price of 45 cents plus 38 cents transportation. Actually, the price level, because of escalations that are built in on both sides, both transportation and the base price, probably would end up at somewhere above \$1 if the contracts were examined at the time the deliveries are expected, 4 to 5 years from now, or 3 to 4 years from now.

The Columbia, Southern and Consolidated project will bring gas into Cove Point and Elba Island, Ga., also, is at somewhere around 85 cents to 95 cents, call it \$1 by the time you regasify and deliver it to the pipeline, compared to gas being delivered to that identical delivery point from domestic sources at some place around 50 cents, in other words, at about half the price.

The only reason that I raised this point is that gas is needed. We have to examine whether or not, on a cost basis, these imports are justified, just as, as to domestic gas, we have to justify on a cost basis what price should be paid.

If there is anything that I would like to emphasize, today, Senator Dole, above all it is that we need all supplementary sources of gas and the turnaround in the exploration and development effort. It is not substituting one for the other. If we need to import oil in order to buy time until we can attain energy self-sufficiency in the United States from the Mideast and from other countries, we similarly need that kind of time on liquefied gas projects until we can develop our new sources of gas 5 to 7 years from now and thereafter.

Senator DOLE. Now, we have touched on the profits of the other companies, but could you identify the five largest companies, the pipelines they operate and how much production they control?

Mr. NASSIKAS. I certainly will supply it for the record. I could probably tell you, now, but I would like to supply it.

Senator DOLE. Well, perhaps you do not know offhand but could you furnish data on their average profits, the rate of return on invested capital for the last 5 years. Do you have that information?

Mr. NASSIKAS. Oh, yes, we have such data on pipelines. We regulate pipelines on a company-by-company basis under utility concepts. This has been done since 1938, since the gas act was passed, so we have all of these figures. These are reported. They are audited; they are reviewed. There are rate proceedings that are almost unending as to pipelines. It is the producers' profits and their financial status that we do not examine on a company-by-company basis in depth at the Federal Power Commission, except as it relates to our pricing.

Senator DOLE. Well, you can furnish that information for the record?

Mr. NASSIKAS. I would be very happy to, Mr. Chairman.  
[The material referred to follows:]

SELECTED GAS AND FINANCIAL STATISTICS FOR THE LARGEST FPC-JURISDICTIONAL PIPELINE COMPANIES

	Columbia Gas Trans- mission Corp.	El Paso Natural Gas Co.	Natural Gas Pipeline Co. of America	Northern Natural Gas Co.	Pan- handle Eastern Pipe Line Co.	Tennes- see Gas Pipeline Co. <sup>1</sup>	Texas Eastern Trans- mission Corp.	United Gas Pipe Line Co.
1972 operating revenue (thousands of dollars).....	794, 824	799, 240	487, 123	419, 554	331, 930	593, 089	492, 003	382, 586
1972 total gas sales (billions of cubic feet).....	1, 416	1, 845	1, 100	899	786	1, 285	953	1, 206
1972 year-end dedicated reserves (billions of cubic feet).....	8, 378	28, 657	9, 030	2 12, 916	5, 305	15, 396	6, 268	7, 266
After-tax net income (thou- sands of dollars):								
1972.....	50, 057	62, 559	52, 754	61, 830	57, 906	144, 216	77, 696	10, 063
1971.....	52, 303	73, 868	41, 589	76, 267	36, 056	142, 681	67, 602	7, 670
1970.....	( <sup>2</sup> )	51, 463	41, 686	47, 443	34, 375	117, 699	59, 384	19, 686
1969.....	( <sup>2</sup> )	46, 236	33, 292	41, 148	27, 771	111, 383	53, 443	16, 044
1968.....	( <sup>2</sup> )	36, 030	32, 281	34, 674	28, 803	129, 252	44, 611	16, 058

<sup>1</sup> Tennessee Gas Pipeline Co., a division of Tenneco Inc.

<sup>2</sup> Preliminary.

<sup>3</sup> Company formed in 1971 in merger of 7 pipeline companies.

Source: Federal Power Commission Forms 2 and 15 filed annually by interstate pipeline companies.

Senator DOLE. If we have all of this gas—I do not know how many trillion cubic feet according to the U.S. Geological Survey—but if you have all of that available—I think you have answered the question—why are we investing, then, in Algeria? Why are major pipeline companies investing in Algerian and Soviet gas?

I think you have already given the answer earlier. We need all of this supplemental production. We are talking about 5, 7 years before we have energy self-sufficiency.

Mr. NASSIKAS. Fifteen to twenty; 5 to 7 years before we start getting much new gas; 15 to 20 before we have energy self-sufficiency, as I understand the term, in the United States, if then.

Senator DOLE. So this is, in your opinion, necessary, the investments in Algeria and Russia and so forth?

Mr. NASSIKAS. No. I do not believe I have stated that Russian LNG is desirable national policy. I do not know on any pending or prospective applications whether we are going to grant them or not. It depends on the economics of the project and our examination and also on an adversary proceeding on the record as to whether I, as chairman, am going to vote in favor of these projects.

We have to analyze the impact upon the public interest, which includes the national security, the reliability of the source, the impact upon the receiving pipeline as to prices, the method by which it is sold, whether it is incremental or whether it is sold on a rolled-in basis, and numerous other bases.

We have cleared two basic projects from Algeria. There are several more pending from Algeria that are in the hearing stage. We have no applications before us, Senator Dole, for any Russian LNG, and I have no commentary as to whether it is desirable to import gas from Russia.

Senator DOLE. I have no further questions, and appreciate your taking the time to appear today. I regret that Senator Gravel could not be here for your statement. He may have had other questions that he wanted to ask, but he may submit them for the record. I read your statement in advance, and I think you covered many of the points about his bill that he may have wanted to discuss. But if not, he will submit supplemental questions.

Mr. NASSIKAS. Thank you, Senator Dole.

One final, unhappy note. Yesterday we conditionally cleared from Canada a price of 61 cents where the Canadian Government has virtually doubled the price of gas for various reasons.

Thank you very much.

Senator DOLE. Thank you.

[The prepared statement of Mr. Nassikas, a response of Mr. Nassikas to a Dec. 11, 1973, Committee request asking assistance in a survey of the supply and demand of natural gas in selected States, and a decision rendered by Mr. Nassikas, follows. Hearing continues on p. 1253).

PREPARED STATEMENT OF JOHN N. NASSIKAS, CHAIRMAN, FEDERAL  
POWER COMMISSION

Mr. Chairman and Members of the Committee:

The Energy Revenue and Development Act (S. 2806) which is the subject of these hearings, is a comprehensive legislative program with the purpose of achieving energy independence for the United States. I share the Committee's views on the paramount importance of that goal and I welcome this opportunity to present my thoughts on the necessary programs and policies to move us toward energy self-sufficiency as rapidly as possible. I have advocated national energy policies to attain optimum domestic energy self-sufficiency for over four years.<sup>1</sup>

It is now clear that our failure to halt the trend toward increased dependence on foreign sources of energy has been a costly mistake. Our Nation should not be exposed to the uncertainties of foreign supplies and the economic and political pressures that can be exercised by those who control those supplies. We have the resource base to support energy self-sufficiency and the technology to develop our resources to satisfy domestic requirements. The energy crisis emerged long before the Arab oil embargo and production cutbacks in October 1973 but despite unmistakable signals in the economy that a shortage was impending, government and industry failed to implement appropriate remedial policies to forestall a severe shortage. In this context the Arab nations serve the American people well by shocking them into the realization that our economic growth and world position cannot be maintained unless the economy possesses at least the capability of producing its own basic resources in the event of a disruption of international trade. Furthermore, the severity of the shortage, compounded as it is by the embargo, will undoubtedly impress upon the nation the importance and necessity of promulgating an integrated, long range energy policy designed to insure the efficient development of our natural resources, the protection of our environment

<sup>1</sup> See *e.g.*, *The Oil Import Question. A Report on the Relationship of Oil Imports to the National Security* by the Cabinet Task Force on Oil Import Control, February 1970—Supplementary Views of the Chairman, Federal Power Commission.

from wasteful and destructive production and consumption practices, and the insulation of our national economy from the threat of foreign economic warfare.

It has become clear that all segments of our Nation must cooperate to achieve the goal of energy self-sufficiency as quickly and as completely as is reasonably possible. President Nixon in his recent energy message of November 25, 1973 has stated the basic fact of the current situation succinctly: "In the last third of this century, our independence will depend on maintaining and achieving self-sufficiency in energy."<sup>2</sup> In support of this belief, the President has pledged R&D expenditures of ten billion dollars over the next ten years. Allocating this amount of money wisely will be a formidable responsibility for the federal government. Yet the necessity of such an expenditure has become clear, and I believe the provisions of S. 2806 would help insure that this funding is in fact utilized as efficiently as possible.

Before discussing the specific policies reflected in this proposed legislation, I would like to make clear that energy self-sufficiency is not only necessary for the purpose of maintaining our position as the world's leading nation, but also the current state of world energy markets makes national self-sufficiency an economic necessity as well. The escalating increases in royalties collected by the Arabs and Venezuelans force the conclusion that world oil prices, now in the range of \$7—\$8 a barrel, could well continue to rise.

#### LNG IMPORT-EXPORT

With respect to LNG, Tables 1 and 2 tabulate respectively long-term and short-term import projects as of November 30, 1973. These tables reflect end-of-year status since no further actions have been taken since November 30, 1973 with exception of the Conditional Approval granted by the Commission to Eascogas LNG, Incorporated in Opinion No. 680, issued December 28, 1973.

The sole U.S. LNG export, from Alaska to Japan, is subject to a long-term contract approved by the Commission in 1967.<sup>3</sup> The sole long-term LNG import in service is that approved by the Commission on March 9, 1972, Opinion No. 613, *Distrigas Corp.*, Docket Nos. CP70-196, *et al.* However, scheduled imports by *Distrigas* of approximately 15.4 million Mcf equivalent have not been received due to alleged technical difficulties in Algeria. When deliveries approved in Opinion No. 622 on June 28, 1972, *Columbia LNG Corporation* (CP71-68, *et al.*), commence in 1976 or later, scheduled LNG imports will become an increasingly important supplement of supply for pipelines serving the eastern United States. The authorized combined imports of *Distrigas* and *Columbia LNG* total in excess of 400 million Mcf equivalent per year. If final approval is given to the *Eascogas* import, the annual LNG import volumes will be increased by an additional 238 million Mcf equivalent per year. Other pending LNG import proposals, if approved, would double these volumes. See Table 1.

<sup>2</sup> The President's Address to the Nation Announcing Additional Actions To Deal With the Energy Emergency, November 25, 1973.

<sup>3</sup> In that proceeding, *Phillips Petroleum Company, et al.*, Docket No. CI67-1226, the Commission authorized on April 19, 1967 the annual export of up to 50.6 Bcf of LNG at a price of 53 cents per million Btu delivered for 15 years.

TABLE 1.—LONG TERM IMPORT PROJECTS FILED WITH THE FEDERAL POWER COMMISSION, NOV. 30, 1973

Source and importer	FPC docket number	Delivery point	Deliveries <sup>1</sup>		Time frame	Status
			Million cubic feet per day	billion cubic feet per year		
1. Skikda, Algeria: Distrigas Corp.	CP70-196, CP72-165, CP72-167, CP72-168, CP73-135, CP73-230.	Everett, Mass., and Staten Island, N.Y.	42	15	1971 (20 years)	Approved.
2. Arzew, Algeria: Columbia LNG Corp.	CP71-68, CP71-289.	Cove Point, Md.	319	116	1976-77 (25 years)	Do.
Consolidated System LNG Co.	CP71-153, CP71-289, CP71-290.	do.	372	136		
Southern Energy Co.	CP71-151, CP71-264.	Savannah, Ga.	372	136		
3. Skikda, Algeria: Escogas LNG, Inc.	CP73-47, CP73-88 <sup>2</sup> .	Staten Island, N.Y. and Providence, R.I.	326 (year 1-2)	119	1975-76 (22 years)	Pending.
			487 (year 3)	178		
			652 (year 4-20)	238		
			408 (year 21-22)	149		
4. Skikda, Algeria: Distrigas Corp.	CP73-132, CP73-230 <sup>3</sup> .	Everett, Mass., and Staten Island, N.Y.	123	45	1975 (20 years)	Do.
5. Aizew, Algeria: El Paso Eastern Co.	CP73-258, CP73-259 <sup>4</sup> .	Gloucester Co., N.J.	422	154	1978 (25 years)	Do.
Transco Energy Co.	CP73-267, CP73-269.	do.	422	154		
Southern Energy Co.	CP73-271, CP73-272.	Savannah, Ga.	112	41		
Consolidated System LNG Co.	CP73-283, CP73-284.	Cove Point, Md.	169	62		
6. Aizew, Dellys, or Skikda, Algeria: Trunkline LNG Co.	CP74-139 <sup>5</sup> .	Lake Charles, La.	490	179	1979 (20 years)	Do.
7. NW Sumatra, Indonesia: Pacific Indonesia LNG Co.	CP74-160.	Port Hueneme, Calif.	620.	226	do.	Do.

<sup>1</sup> 1,000 Btu/ft<sup>3</sup>.<sup>2</sup> Related docket numbers: Algonquin LNG, Inc., CP73-139, Algonquin Gas Transmission Co., CP73-197, New England LNG Co., Inc., CP73-199.<sup>3</sup> Related docket numbers: El Paso Natural Gas Co., CP73-260; Transco Terminal Co., CP73-268; Transcontinental Gas Pipeline Corp., CP73-270; Southern Natural Gas Co., CP73-273.<sup>4</sup> Related docket numbers: Trunkline LNG Co., CP74-138; Trunkline Gas Co., CP74-140.<sup>5</sup> Related docket number: Distrigas Pipeline Corp., CP73-148.

TABLE 2.—FEDERAL POWER COMMISSION—SHORT-TERM LNG IMPORT APPLICATIONS, NOV. 30, 1973

Applicant	Docket No.	Source	Mode of transportation	Point of delivery	Quantity (MM ft <sup>3</sup> )	Price (dollar per M ft <sup>3</sup> )	Date of authorization
1. Boston Gas Co	CP69-112	Algeria	Ship	Boston, Mass.	200	1.14	Oct. 25, 1968
2. Lowell Gas Co	CP70-143	do	do	do	374	1.52	Dec. 17, 1969; Jan. 15, 1970.
3. Wilbros Terminal Co	CP70-194	Canada	Truck	do	4266	2.20	Feb. 13, 1970; May 12, 1970.
4. Texas Eastern Transmission Corp.	CP70-208	Algeria	Ship	Staten Island, N.Y.	2,600	1.37	Mar. 16, 1970; Apr. 8, 1970.
5. Boston Gas Co	CP70-291	do	do	Boston, Mass.	1,600	1.70	July 14, 1970; Nov. 15, 1970.
6. Fall River Gas Co	CP70-305	Canada	Truck	Fall River, Mass.	6150	1.12	July 2, 1970; July 17, 1970; Sept. 22, 1970.
7. Lowell Gas Co	CP71-9	do	do	Tewksbury, Mass.	630	1.25 before Oct. 7, 1970; 1.94 Oct. 7, 1970 to Apr. 30, 1971.	Aug. 28, 1970; Mar. 15, 1971.
8. Boston Gas Co	CP71-61	do	do	Boston, Mass.	220	1.25 Oct. 19, 1970 to Nov. 1, 1970; 2.00 Nov. 1, 1970 to Apr. 1, 1971.	Nov. 4, 1970.
9. Boston Gas Co	CP71-247	do	do	do	6714	1.30 Apr. 1, 1971 to Sept. 1, 1971; 1.45 Sept. 1, 1971 to Nov. 1, 1971; 1.92 Nov. 1, 1971 to Apr. 1, 1972. <sup>6</sup>	June 4, 1971.
10. Boston Gas Co	CP71-248	Algeria	Ship	do	1,250	1.66	Do
11. Lowell Gas Co	CP72-10	Canada	Truck	Tewksbury, Mass.	6696	1.30-1.45; Apr. 1, 1971 to Oct. 31, 1971; 1.92 Jan. 1, 1971 to Apr. 1, 1972. <sup>6</sup>	Aug. 5, 1971.
12. Fall River Gas Co	CP72-18	do	do	Fall River, Mass.	6120	1.30 before Aug. 31, 1971; 1.45 Aug. 31, 1971 to Oct. 31, 1971. <sup>6</sup>	Sept. 8, 1971.
13. Texas Eastern Transmission Corp.	CP72-93	Libya	Ship	Staten Island, N.Y. <sup>6</sup>	611,160	0.81 <sup>6</sup>	( <sup>10</sup> ).
14. Distrigas Corp.	CP72-165 (terminated)	do	do	do			
15. Lowell Gas Co	CP72-301 (withdrawing)	do	do	do			
16. Boston Gas Co	CP73-40	Algeria	Ship	Boston, Mass.	7675	1.87	Sept. 25, 1972.
17. Lowell Gas Co	CP73-63	Canada	Truck	Tewksbury, Mass.	6539	1.73 Sept. 1, 1972 to Nov. 15, 1972; 1.58; Nov. 15, 1972 to Apr. 30, 1973.	Nov. 27, 1972.
18. Distrigas Corp.	CP73-78	Algeria	Ship	Everett, Mass., and Staten Island, N.Y.	659,000	( <sup>9</sup> ).	Pending.
19. Boston Gas Co	CP73-98	do	do	Everett, Mass.	62,380	1.43 <sup>6</sup>	Jan. 9, 1973
20. Brockton Taunton Gas Co	CP73-307	Canada	Truck	Eastern, Mass.	6400	1.46 <sup>6</sup>	July 31, 1973.
21. Providence Gas Co	CP73-338	do	do	Exeter, R.I.	6120	1.50 <sup>6</sup>	Do
22. Lowell Gas Co	CP74-3	do	do	Tewksbury, Mass.	591	1.58 <sup>6</sup> to 1.70 <sup>6</sup>	Oct. 10, 1973

<sup>1</sup> To date, less than 3 years; also typified as not requiring substantial new construction of facilities.

<sup>2</sup> Unless otherwise noted, volumes and prices are as reported in the respective applications filed with the FPC and have been rounded to the nearest million cubic feet and cents per thousand cubic feet where necessary; delivery at shipral or truckside.

<sup>3</sup> Estimated from the original filing on basis of 52 M ft<sup>3</sup> per metric ton.

<sup>4</sup> Estimated from reported volumes delivered.

<sup>5</sup> Estimated from the original filing on basis of 83.3 cubic feet per gallon.

<sup>6</sup> Volume is billion Btu and price is dollar per million Btu.

<sup>7</sup> Option for an additional 370 million cubic feet equivalent, exercisable until Feb. 1, 1973.

<sup>8</sup> Not including transportation.

<sup>9</sup> 40 cents per million Btu base price; freight rate of 60 cents per million Btu for 1st 20 trillion and 30 cents per million Btu for remaining Btu.

<sup>10</sup> 2 shiploads authorized Feb. 15, 1972; examiner's decision approving import issued May 2, 1972; withdrawn Sept. 17, 1973.

## NATURAL GAS PIPELINE IMPORTS

Pipeline imports of natural gas reached an all time high of 1,017 billion cubic feet in 1972, equivalent to about four percent of the gas consumed in the U.S. In 1972, over 99 percent of the imports came from Canada with the remainder from Mexico. Currently there are 10 pipeline companies importing gas from Canada with one pipeline company and one municipality importing gas from Mexico. The following table lists the imports by company from each country:

## NATURAL GAS PIPELINE IMPORTS, 1971-72

[Volumes in billions of cubic feet]

	Point of entry	1971	1972
<b>Imports from Canada:</b>			
El Paso Natural Gas Co.	Sumas, Wash.	189.1	255.5
Do.	Eastport, Idaho	51.2	50.9
Great Lakes Gas Transmission Co.	Noyes, Minn.	99.1	111.3
Michigan Wisconsin Pipe Line Co.	do.	18.2	18.3
Midwestern Gas Transmission Co.	do.	119.5	119.1
Pacific Gas Transmission Co.	Eastport, Idaho	354.0	383.9
Tennessee Gas Pipeline Co.	Niagara Falls, N.Y.	19.2	3.7
ICG Transmission Ltd.	International Falls, Minn.	7.2	8.1
The Montana Power Co.	Whitlash, Mont.	16.0	16.4
Do.	Babb, Mont.	28.6	32.2
The St. Lawrence Gas Co., Inc.	Massena, N.Y.	5.9	5.9
Vermont Gas Systems, Inc.	Highgate, Vt.	2.8	3.7
Subtotal, Canada		910.9	1,009.0
<b>Imports from Mexico:</b>			
Texas Eastern Transmission Co.	McAllen, Tex.	20.7	8.1
City of Roma, Tex.	Roma, Tex.	(1)	(1)
Subtotal, Mexico		20.7	8.1
Grant total imports		931.6	1,017.0

<sup>1</sup> Less than 40,000,000 cubic feet annually.

Note: Totals may not add due to rounding.

Significant increases in imports of natural gas from Canada depend upon the development of gas resources in the frontier areas, e.g., Mackenzie Delta, Arctic Islands and Canada's Atlantic Offshore. Future Canadian requirements for natural gas are protected by a formula administered by the National Energy Board (NEB). The NEB requires that an amount of gas equivalent to 25 times the forecast domestic market requirements four years into the future (equivalent to a 30-year R/P ratio), is set aside for Canada's use.

In 1970 and in 1971 export applications were rejected because the established reserves were insufficient to allow for additional exports. However, the NEB did not consider any of the recently discovered reserves in the Mackenzie Delta, Arctic Islands or Atlantic Offshore areas in its surplus determination because they were not developed sufficiently to be considered within "economic reach". Until the NEB does consider the "frontier" area reserves in its gas surplus determinations, substantial additional export authorizations are unlikely.

Another responsibility of the NEB in regard to natural gas exports is to determine that the export price of gas does not result in prices in the U.S. market area materially less than the least cost alternative for energy from indigenous sources. Additionally, in 1970 a condition was imposed on certain export licenses to require that the export price be 105 percent of the existing rate in the areas of Canada where the gas crossed the international border.

A recent determination, which involved the 105 percent export price requirement, was made on January 11, 1974, by the NEB. An arrangement between Westcoast Transmission Company Limited (Westcoast), El Paso Natural Gas Company's (El Paso) Canadian supplier, and British Columbia distributors resulted in an increase in the wholesale rates charged by Westcoast to the distributors. The rate to one of the distributors (British Columbia Hydro and Power Authority) increased to 58 cents per Mcf as evidenced by a contract between Westcoast and the distributor dated November 13, 1973. As a consequence, Westcoast increased the rate under the Westcoast-El Paso Sumas IV Contract from its then current level of approximately 32 cents per Mcf to approximately 61 cents per Mcf (58 cents per Mcf  $\times$  105 percent).

After several meetings with representatives of the companies involved, the NEB informed Westcoast that the export prices received by them should be 105 percent of the prices payable by the British Columbia distributor to Westcoast with the effective dates of such export prices being November 14, 1973. Based on the NEB determination Westcoast takes the position that it is foreclosed from making export deliveries to El Paso at other than the rate of approximately 61 cents per Mcf. As a result, El Paso indicates that it is afforded the alternatives of (1) accepting termination of Canadian gas deliveries at the Sumas import point, which currently constitutes some 60 percent of El Paso's Northwest Division System supplies, or (2) paying the higher rate prescribed by the NEB.

On January 16, 1974, El Paso requested by letter specific authorization from the Commission to make purchases at the new rate. The Commission is currently considering appropriate action on El Paso's request.

Preliminary data indicates that the level of natural gas pipeline imports in 1973 was about the same as in 1972. This is due to the fact that pipeline companies have been importing natural gas at near their maximum authorized rate since the beginning of the 1971-1972 winter heating season.

#### DEVELOPMENT OF THE OUTER CONTINENTAL SHELF

About one-half of U.S. potential gas and oil resources are located in the Outer Continental Shelf; however, only about two to three percent of those lands have been leased. Along the Atlantic offshore areas, there is estimated to be a potential of 12 billion barrels of oil and 35 trillion cubic feet of natural gas (excluding offshore Florida), yet not one exploratory well has been drilled from Maine to Florida.<sup>4</sup>

Currently, the Council on Environmental Quality (CEQ) is conducting a one-year study of the environmental impact of exploration and development activities on the Atlantic Outer Continental Shelf and in the Gulf of Alaska. This study, which will be completed in April or May of this year, is a necessary prerequisite to leasing in those areas. Another constraint on offshore leasing that has yet to be resolved is the pending litigation between some Eastern Seaboard states and the Federal government over their respective jurisdiction over offshore areas.

In the 20-year period 1954-1973, the Department of the Interior leased over eight million acres on the Outer Continental Shelf. Over two million acres have been leased since 1969. However, over the past five years there have been inadequate lease sales to produce the level of commitment necessary to meet forecasted demand. Two large lease sales in the Southern Louisiana Gulf Coast in September and December of 1972 and a third large lease sale in the Texas Gulf Coast in June 1973 comprise over one-half of the total leased in the past five years. We must remember that lease sales held in 1969 are only now yielding gas for consumers and full productivity from developed wells will not be attained until 1975 and 1976. Lease sales in the Gulf held in December 1972 and June 1973 will not contribute improved gas supply until 1976 or 1977, with full impact on pipeline deliverability being deferred until 1979-1980. When unexplored horizons are leased for exploration and development in areas in the Atlantic Outer Continental Shelf (where there are no gas pipelines), the lead time may extend to seven years from the time a lease is committed, prospects located, exploratory wells drilled, platforms installed, and pipelines constructed for delivery of the gas to market. The Department of the Interior has announced plans to hold three lease sales per year of up to one million acres each. I would urge that leasing three million acres annually should be a specific target objective starting in 1974 and continuing thereafter for a decade with adjustments in the program as may be warranted by our program toward energy self-sufficiency.

#### ALASKAN GAS

The most recent report from the Potential Gas Committee<sup>5</sup> indicates that almost thirty-two percent of the total U.S. potential gas supply is in Alaska.

<sup>4</sup> The George's Bank Petroleum Study, Massachusetts Institute of Technology, Report No. MITS/G73-5, February 1, 1973, concluded that no identifiable effects of offshore production were found which would appear likely to upset the George's Bank ecosystem.

<sup>5</sup> The Potential Gas Committee is a cooperative effort of the natural gas industry, sponsored by (and under the direction of) the Potential Gas Agency of the Mineral Resources Institute of the Colorado School of Mines Foundation, Inc. The Agency was selected and its activities are financed by the Gas Industry Committee representing the American Gas Association, the American Petroleum Institute and the Independent Natural Gas Association of America. The Committee is comprised of over 100 individuals from the production, transmission and distribution segments of the natural gas industry, along with members and observers from state and Federal agencies, Canada, Mexico, and the National Association of Regulatory Utility Commissioners.



The onshore and offshore estimate of potential Alaskan gas totals 366 trillion cubic feet. Exploration in Alaska has been moving slowly because of delays in the Trans-Alaska pipeline project and the leasing freeze. According to the Committee's report, "there is little incentive for industry to invest large amounts of money in expensive exploratory activities until prospects are better than land will become available for leasing in more attractive exploratory areas such as the Gulf of Alaska, lower Cook Inlet and the Bering Sea."<sup>6</sup>

#### RESPONSE TO THE SHORTAGE

This Commission has taken numerous actions, consistent with our Congressionally delegated powers under the Natural Gas Act, to reverse the gas supply shortfall and to allocate our gas resources more effectively, but it should be recognized that the actions of one Commission circumscribed by existing law as to its jurisdiction over interstate gas supply and electricity, are inadequate to cope with the present national energy emergency involving complex interrelationships among all energy forms. Consequently, the Congress must give serious consideration to the various policies proposed in S. 2806 and implement those which will most expeditiously balance supply and demand in the short run and ultimately lead to balanced domestic energy markets in the long run.

#### SHORT RUN SUPPLY-DEMAND EQUILIBRIUM

Regardless of the intensity with which we begin expanding our energy resource production activities, the physical realities of exploration, development, production and transportation imply that years will pass before major new energy supplies can be brought to the market place, yet our economy is suffering the effects of the shortage now. Production bottlenecks are developing in sectors unable to procure necessary energy inputs and inappropriate or undirected rationing of limited supplies damages industry structures and causes suffering among those less well-to-do sectors of the population which have always lived on a tight energy budget. A few years of shortage will inevitably pass before production can be increased substantially; and in order to minimize economic and social damage through this time the Congress must establish the means to determine an appropriate demand reducing policy and implement it so that supplies are made available to cover the more urgent needs first.

#### EXCISE TAX ON ENERGY

Recent developments in the world energy market have strengthened the case for an excise tax on energy. Such a tax could be used not only to generate substantial additional revenues for energy R&D but also to inhibit demand for energy to help limit the windfall profits which will accrue to sellers in a period of fuels shortages. Clearly the choice of an appropriate energy tax policy depends on which of these three goals we wish to emphasize. Consequently I would like to discuss the three potential uses of such a tax.

First, certain types of energy taxes will decrease demand more efficiently than others. For this reason it may be worthwhile to examine alternatives to the form of tax in S. 2806.

S. 2806 would impose a flat-rate on the Btu content of oil, gas, and coal. Electricity would also be taxed on the same basis to the extent that it is generated with fuels other than oil, gas, or coal. Since this tax would be imposed at the primary source of production, there would be no differentiation among the various end uses of energy. Under this tax concept, the primary energy producer or importer would be responsible for payment of the tax which would be passed on as part of the fuel cost to the ultimate consumer.

An alternative approach is to levy the Btu tax at a later stage of production or at the wholesale level so that, for example, petroleum products rather than crude oil would be taxed. An advantage of the latter approach is that the tax rate could be varied according to the type of fuel and its value to the user. Motor fuel, for example, could be taxed at a higher rate than home heating oil, residual fuel oil, or coal. With the same rate on the Btu content of all fuels, the effective tax rate per dollar of sales price will be lower for high value fuels, such as gasoline, than for low value fuels, such as boiler fuels. And the rate of tax would not vary according to the potential for reducing demand.

<sup>6</sup> *Potential Supply of Natural Gas in the United States (As of December 31, 1972)*, A Potential Gas Committee Report, November 1973, p. 25.

A third alternative is an *ad valorem* tax on fuels and energy at the wholesale or retail level. Under this method the tax would be directly related to the value of each fuel. A uniform-rate tax would preserve the existing interfuel price relationships, but it would also be possible to design a multiple-rate tax varying according to the demand characteristics of the end-use markets. Similarly, the tax rates could be selected to influence the allocation of energy resources in accordance with other Federal energy programs—for example, to encourage the substitution of coal for oil.

With an *ad valorem* tax, however, large consumers purchasing natural gas or electricity under declining block rates would pay relatively lower taxes than with equivalent Btu tax rates. This disadvantage could be avoided by offsetting adjustments in the block rates provided the regulatory commissions were empowered to do so.

I believe that research and development should be funded by the Congress from general revenues since the Nation as a whole will receive the benefit of a return on R&D expenditures rather than a specialized class of energy users. However, if funding in this manner cannot practicably accomplish the objective, I would endorse an across-the-board Btu tax on producers to fund an R&D program as provided in S. 2806.

However, regardless of the form of the energy tax, as it is used selectively to inhibit demand, it would absorb a portion of the excess profits that might accrue to energy suppliers in a period of shortages; that is, the tax would raise energy prices paid by consumers, but it would divert the increased revenues to the U.S. Treasury for research and development rather than to the sellers from their corporate purposes.

#### LONG RUN EQUILIBRIUM

Limiting demand in the short term, however, is only part of the job. If we are to achieve national self-sufficiency in energy, with balanced domestic energy markets, we must begin developing higher cost domestic sources of supply. But production of these resources will not occur unless higher prices make such development economically feasible, and firm government policies are adopted to encourage development of both natural resources and the more exotic sources of energy through R&D.

#### TERMINATION OF PRICE CONTROLS

Although it is clear that price increases to a degree may be necessary, it is questionable whether Congress should terminate the authority under the Economic Stabilization Act to stabilize the prices of crude oil, petroleum products, coal, and equipment and supplies used in fossil fuel extraction, refining and transportation. The price control authority assigned to the Cost of Living Council and the Federal Energy Office would appear to be needed to prevent runaway prices while allowing sufficient incentive for producers and manufacturers to increase their output.

#### DEREGULATION OF "NEW" GAS DEDICATED TO THE INTERSTATE MARKET

The case of natural gas is a special situation because of the restrictive provisions of the Natural Gas Act as interpreted by the courts. Section 502 of S. 2806 would decontrol "new" gas, except for sales made by producer affiliates of pipelines,<sup>7</sup> and would grant sanctity of contract to all rates previously determined to be just and reasonable by the FPC.

The sanctity of contract provision will assist in removing the element of regulatory uncertainty which has acted as a deterrent to long-range planning and commitment of capital for gas exploration and development. Sections 502(e) and (f) of S. 2806 would amend Sections 4(e) and 5(a) of the Natural Gas Act so as to preclude Commission review of the reasonableness of pipeline purchases of gas exempted under the proposed Section 1(b) and our denial in whole or in part of the cost of such pipeline purchases in excess of reasonable cost, except as to the price paid to pipeline affiliates which exceed those received by nonaffiliates. Thus, such changes would afford no regulatory protection to the ultimate consumer and I, therefore, oppose those amendments, even though I support the deregulation of new gas prices.

Unlike the Administration's decontrol bill, S. 2048, there is no provision for monitoring prices and reimposing price controls. I believe that the Federal Power

<sup>7</sup> On December 12, 1973, I presented in detail my views concerning the competitive implications of vertically integrated pipeline-producer operations in the natural gas industry. See hearings before the Special Subcommittee on Integrated Oil Operations of the Committee on Interior and Insular Affairs, U.S. Senate, 93rd Congress, 1st Session.

Commission should be vested with responsibility to monitor the efficacy of new gas deregulation and to report annually to the Congress concerning prices and volumes in all areas of the United States, and that there should be a mandatory Congressional review of the effectiveness of new gas deregulation in allocating gas resources through better supply-demand balance five years after enactment of the legislation. Combined with the Federal Power Commission's strict surveillance of volumes and prices of new gas dedications to the interstate market there should be rigid enforcement of the antitrust laws by the Justice Department and the Federal Trade Commission to assure the justness and reasonableness of market-determined prices under workably competitive conditions.

If Congress does not adopt the option of deregulation to allow the impersonal forces of the marketplace to regulate new gas supply and demand and believes that deregulation must include concomitant authority to reimpose controls during the time required to dedicate new supplies to the interstate market in response to market regulation (5 to 7 years), then I recommend that the Federal Power Commission—not the Department of the Interior, as recommended in the Administration bill—be assigned the responsibility to reimpose controls as set forth in Section 24 of S. 2048 by application of the following criteria:

- (1) current and projected prices of other fuels at the point of utilization, adjusted for differences in heating values;
- (2) premium nature of natural gas and its environmental superiority;
- (3) current and projected prices of imported LNG and synthetic natural gas; and
- (4) adequacy of prices to provide the necessary incentive for domestic exploration and production and efficient end-use.

However, if regulation of natural gas is continued, the FPC should be allowed to depart from the dictates of historic cost-based pricing in setting price levels for both new and old gas and to be expressly empowered to determine reasonable prices based on commodity value, the price of alternate fuels, and economic and market factors in addition to cost considerations—essentially the same criteria which would govern the reimposition of controls. Only in this manner can proper recognition be given to the premium qualities of natural gas and to interfuel price relations which determine the market clearing price of gas.

It has been widely recognized that the present shortage of natural gas is due in part to the restrictive pricing policies of the past and the cost-based regulatory limitations inherent in the Natural Gas Act.

The two basic options relative to improving the allocations of gas supply are (1) either the Natural Gas Act should be amended to allow natural gas pricing by the Federal Power Commission on the basis of economic and market considerations over and above costs of production or (2) preferably, new gas should be deregulated as proposed in S. 2806, with the revisions outlined herein, to allow market factors to determine price levels and ration natural gas provided that there is strict surveillance and monitoring of prices, volumes and market by the Federal Power Commission, the Federal Trade Commission, and the Department of Justice.

Deregulation of new gas committed to the interstate market will more effectively allocate our natural gas resources by:

- (1) Eliminating the disparity between the unregulated intrastate price of natural gas comprising one-third of gas consumption and the regulated interstate price comprising two-thirds of gas consumption.
- (2) Avoiding distortions in the price of current natural gas supply from—
  - (a) pipeline imports ranging to double the regulated price of domestic gas to the same West Coast and Mid-West markets;
  - (b) LNG imports delivered to East Coast markets at two-three times the delivered price of natural gas from domestic sources to the same city gate;
  - (c) reformed gas and coal gasification at two-three times the price of gas to the same pipeline delivery points.
- (3) Equilibrate natural gas supply and demand by an increase in price to the market clearing level as the result of the operation of workably competitive market forces, restraining artificial demand induced by prices established below real market value and stimulating supply by market price incentives for greater investment in exploration, development and production of natural gas.

#### EXCESS PROFITS TAX

Higher prices are desirable and necessary, provided they do not exceed the levels required to provide necessary service by increasing supply to attain equi-

librium with demand under workably competitive conditions. Sellers should not be allowed to collect windfall profits while the rest of the nation bears the inconvenience of shortages. Consequently, I support the principles of an excess profits tax. Such a tax should be structured to capture any windfall profits accruing to sellers of fuels while not reducing the incentive to those who would expand production of traditional resources or develop new higher cost sources of energy. The Administration has proposed an Emergency Windfall Profits Tax with that purpose in mind, but I recognize that there are other possible approaches, such as that provided in S. 2806, which may fill the need.

#### ENERGY REORGANIZATION

Enactment of S. 2806 would restructure much of the energy functions of government. Title III of the bill provides for the establishment of a Federal Energy Administration to develop and administer national energy policy as well as a comprehensive energy research and development program. Title IV would create an independent Commission on Energy Technology Assessment which would monitor and evaluate governmental and publicly financed energy R&D efforts and advise the Federal Energy Administration on future energy needs and how they can best be met. In addition, that Commission would be responsible for devising and maintaining an economic model of the energy needs of the United States and the alternative means and costs of meeting those needs.

As I have stated over the last four years, I support the concept of centralized responsibility for energy policy in government.<sup>8</sup> As a prerequisite, however, we must first determine and define our national energy policy choices and priorities. Having made these decisions, we can then plan the restructure of governmental responsibility to serve the attainment of those objectives. I believe this proposed legislation contributes significantly to the policy options available in selecting a workable energy and energy R&D structure for government. These proposals, together with the Administration's reorganization suggestions, including the establishment of an Energy Research and Development Administration, as well as a Department of Energy and Natural Resources, should be carefully evaluated in the context of our emerging energy policy priorities. Whatever reorganized federal energy structure is adopted, it is clearly essential that we must centralize and streamline responsibility for energy policy and planning and vest the reorganized agencies with sufficient jurisdiction and authority within government to assure that national energy objectives are accorded their proper weight and importance in all government policy and planning activities, both domestically and internationally.

#### ENERGY TRUST FUND

The importance of energy R&D has received the recognition of the Congress as well as the Administration. I note, Mr. Chairman, that in introducing the proposal under consideration today, you referred to the broad range of energy options, including the conventional sources and the more exotic alternatives such as solar, geothermal, and nuclear fusion, and you stated that, "[A] strong, well-coordinated research and development program is necessary to develop these alternatives and to translate their technological feasibility into commercial uses in most environmentally sensible way possible."<sup>9</sup> Similarly, the President has frequently asserted that energy R&D is the key to achieving energy self-sufficiency while simultaneously protecting the environment. I support the establishment of an Energy Trust Fund or similar financing method to fund the expanded level of Federal R&D commitment required to supplement private research and development expenditures by the energy industry.

<sup>8</sup> Shortly after I joined the FPC as Chairman, August 1, 1969, I proposed to the Congress the establishment of a National Energy Resources Council with the primary purpose of examining the Nation's energy resources in relation to long-term requirements. Hearings before the Subcommittee on Energy, Natural Resources, and the Environment of the Committee on Commerce, United States Senate, 91st Congress, 2d Sess., p. 52, January 30, 1970. See also Hearings before the Subcommittee on Energy, Committee on Science and Astronautics, U.S. House of Representatives, 93rd Congress, 1st Sess., May 17, 1973; Hearings before the Committee on Interior and Insular Affairs, U.S. Senate, 93rd Congress, 1st Sess., June 22, 1973; and Hearings before the Subcommittee on Legislation, Committee on Government Operations, U.S. House of Representatives, 93rd Congress, 1st Sess., December 11, 1973. The Senate has passed S. 70 and S. 2176 both of which provide for a Council on Energy Policy to coordinate all energy activities of the Federal Government and to prepare a long-range comprehensive plan for energy development. The House has not yet acted on these measures.

<sup>9</sup> Cong. Record, December 13, 1973, page 522726

Dr. Dixy Lee Ray, Chairman of the Atomic Energy Commission, recently prepared a R&D assessment at the request of the President in which she estimates federal energy R&D funding requirements totalling ten billion dollars over the next five years with a suggested funding level for energy research and development in FY 1975 at approximately 1.6 billion dollars.<sup>10</sup>

S. 2806 provides that 99 percent of the revenues generated by the Btu tax be used for energy R&D. While I recognize the necessity of generating substantial R&D funds without adding to the Federal deficit, it does not necessarily follow that such funds should be tied directly to the revenues from the energy tax.

Because the benefits will be realized in productivity gains and faster economic growth, as well as in improvements in the quality of the natural environment, the government's cost of energy R&D funding should be carried by society as a whole, preferably through financing from the Treasury's general funds. If, however, it is decided to link R&D expenditures with energy tax revenues, the tax should not necessarily be structured to decline after 1978. There may be merit in a tax rate rising gradually to a maximum, but the maximum rate should be collected as long as the revenues are needed. I see no reason at this time to anticipate a declining need for the revenues after 1978.

Another reason for not tying R&D funding to energy tax revenues relates to the use of the tax for purposes other than revenue generation. If, for example, selective or variable energy taxes were imposed for the purpose of inhibiting demand, there would be no way to coordinate the criteria for demand reducing tax rates with the necessity of generating certain levels of revenue for R&D funding. In other words, with earmarking it is difficult to avoid either over-financing or under-financing of the selected programs.

If it is decided to earmark these tax revenues for energy R&D, over- or under-financing could still be avoided through appropriations authorized in Sec. 201(c) of S. 2806. Tax rates could thus be set independently of the need for R&D funding revenues. On the other hand, if the tax revenues exceeded R&D requirements, the excess should be transferred to the Treasury.

As you indicated in your statement introducing S. 2806, Mr. Chairman, the federal government is faced with the "urgent task" of defining "the respective roles of the public and private sectors in carrying out a national energy policy."<sup>11</sup>

With respect to the structure and funding of energy R&D, recent energy industry efforts should be noted for their potential contribution to our overall long-range R&D effort in the energy area. In 1972 all sectors of the electric utility industry established the Electric Power Research Institute (EPRI) to carry out and fund a cooperative R&D program. This new institutional framework brings together the publicly owned, cooperatively owned and privately owned sectors of the electric utility industry in a combined effort to identify and develop the most promising programs to both improve current technology and to devise new energy sources and systems. Current funding for EPRI amounted to \$90 million for 1973 and \$150 million for 1974 with substantial additional annual increments beyond this year. Similarly, this month the American Gas Association has announced the natural gas industry's intent to embark upon a long-term research and development effort for the balance of this century. The program is expected to require about \$2.3 billion for the first five years, a substantial increase over the \$75 million per year previously expended for the industry on all forms of R&D. The R&D program will concentrate in six major areas: exploration and development, synthetic natural gas (SNG), transmission, distribution, liquefied natural gas (LNG), and utilization. The industry is currently evaluating fund raising and organizational alternatives necessary to implement the plan.

Parallel efforts by industry such as these ambitious and innovative programs adopted by the electric power and natural gas industries are essential complements to the massive increase scheduled for federal energy R&D efforts. Furthermore, such consolidation and coordination of R&D activities are necessary to avoid wasteful duplication of efforts and to give impetus to the overall energy technology effort.

But these efforts are only a beginning. It is now clear that we must move forward on several fronts. For the immediate future, we must adopt tax, or other allocation measures designed to deal temporarily with the immediate shortage to serve the public interest. Second, we must allow prices to rise sufficiently to

<sup>10</sup> See *The Nation's Energy Future*, A Report to Richard M. Nixon, President of the United States, submitted by Dr. Dixy Lee Ray, Chairman of the Atomic Energy Commission, December 1, 1973.

<sup>11</sup> *Congressional Record*, December 13, 1973, p. S. 22729.

induce expanded exploration and development of conventional resources. Third we cannot expect private investors to carry the whole burden of research and development of new exotic energy sources when the payoff from such investment may not begin for fifteen or twenty years when such projects become commercially feasible.

Finally, we must not forget that all our efforts to induce increased supplies of energy will be in vain if we do not simultaneously discourage wasteful usage of the resources available.

In this respect I would like to point out that the U.S. does not show an impressive record of energy use efficiency in general. Therefore, perhaps the most critical R&D priority with respect to our existing resource base is in the field of energy conservation.<sup>12</sup> The truth of the matter is we are wasting the majority of the energy value of the resources we do have available. For example, due to economic and technological limitations we recover only about 31% of the oil from any given reservoir. If the oil thus produced is used to generate electricity we ultimately recover only about 10% of the Btu value of the resource. This is due not only to the initial low recovery from the reservoir but also to the fact that the conversion of a primary fuel like oil to electricity results in the loss of almost 70% of the oil's energy value in the process of conversion. Further losses of about 10% occur in the transmission of the electricity with yet additional losses often occurring in the end use of the electricity since many electrical appliances are not designed to maximize the value of their power supply.

Research and development must be concentrated in areas such as these if we are to make a substantial improvement in our utilization of our existing resources.

I appreciate the opportunity to present my views on this important legislation. I will be pleased to respond to any questions you may have.

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FEDERAL POWER COMMISSION,  
Washington, D.C., February 4, 1974.

Hon. MIKE GRAVEL,  
Chairman, Subcommittee on Energy,  
U.S. Senate, Washington, D.C.

DEAR SENATOR GRAVEL: This letter is in response to your request of December 11, 1973, soliciting the assistance of this Commission in a survey of the supply and demand of natural gas in selected states now being conducted by the Subcommittee on Energy of the Senate Finance Committee. The curtailment data requested in your letter have been composited by the staff of the Commission from two report forms currently being submitted to the Commission by major interstate natural gas pipeline companies, namely, "Report of Gas Supply and Requirements," FPC Form 16 and "Monthly Report of Natural Gas Pipeline Curtailments," FPC Form 17. The Form 16 report gives supply and requirements volumes by pipeline by month for past and projected 12-month periods. An April 30 filing reports actual volumes for the past year, April through March, and projected volumes for the succeeding year, April through March. A September 30 filing gives actual volumes for the past year, September through August, and projected data for the succeeding year, September through August. The Form 17 report gives actual curtailment volumes by pipeline, by month, and is submitted monthly on or before the 15th day of the month following the reporting month. A blank copy of each of these reports is attached.

The information requested in Questions 1 and 2 of your letter of December 11 has been compiled from the monthly Form 17 reports. These reports do not presently require the responding pipeline company to designate the state in which a particular curtailment was effected, but only the delivery points at which curtailed volumes were delivered. Moreover, the report form does not presently require the respondent to designate the state in which a particular delivery point is located. In order to estimate the curtailed delivery volumes on a state basis from the data available, the staff utilized Commission records, other pertinent reference sources, such as Moody's and Brown's Directory, and, in some instances, direct correspondence with the companies. The Commission is presently studying

<sup>12</sup> The Federal Power Commission has issued a policy statement urging emergency actions for conservation of petroleum and natural gas fuel resources by electric utilities to attain an overall nationwide electric energy reduction of 10 percent. See Order No. 496, Nationwide Fuel Emergency, Docket No. RM74-7, issued November 29, 1973. The Commission also issued an order on December 21, 1973, defining further emergency procedures for conservation of natural gas to reduce wasteful uses of gas in order to allocate limited supplies to essential uses. See Order No. 498, Nationwide Fuel Emergency, Docket No. RM74-8.

the feasibility of obtaining more detailed delivery point data and possibly data which would specify the states in which curtailments were effected (the information actually sought in your request) in conjunction with future curtailment reports. Data on historical curtailments from November 1970 through September 1973 are presented in Table I, Schedules 1 through 5.

Table II, Schedules 1 through 3, present projected curtailments for the period September 1973 through August 1974. These data are not reported on a state basis or by class of sale, i.e., direct industrial or sales for resale. Rather, they are reported on a total company basis, separated only between firm and interruptible service. Moreover, the reporting companies do not project curtailments assuming various regulatory/pricing policy options as mentioned in your letter. The responses, therefore, represent the respondents' best projections of curtailments under the supply, price and regulatory conditions which are expected to prevail over the estimation period. Any attempt by the Commission to modify the company projections according to the regulatory/pricing scenarios suggested in your letter would be pure conjecture on our part. Any such estimate would entail predicting the gas producers' production response to various regulatory/pricing options (supply elasticity), the lag time which would ensue between such a response and its effects on pipeline supply, the relationship between a pipeline company's total system supply and its purchases from producers, and ultimately the ability of gas distribution companies to serve their customers under varying degrees of curtailment (i.e., the availability to distributors of alternative supply sources such as SNG, LNG, etc.).

Finally, with respect to your request for the Commission's estimates of the effect of phased deregulation of natural gas prices, along the lines of the Administration's proposal, on future supply, demand, and price, no one has yet been able to develop estimates which I am prepared to accept at this time. All of the known studies of supply and demand elasticities are based on past experience which, in my view, is not applicable to today's conditions of large price increases, general fuels shortages, and environmental protection standards. This observation applies to the Commission staff's econometric model of gas supply presented as evidence in the area rate proceedings, as well as to the study by Erickson and Spann published in *The Bell Journal of Economics and Management Science* (Spring 1971) and the latest work by Professor Paul MacAvoy of the Massachusetts Institute of Technology. (For example, see his article in *The Bell Journal of Economics and Management Science*, Autumn 1973). The Commission's staff has analyzed all of the published studies and, with respect to the MIT project, our staff has provided substantial assistance to Professor MacAvoy, but the staff continues of the view that we do not yet have reliable estimates of the probable price changes and supply responses to phased deregulation of natural gas prices. This research is still being pursued within the Commission and any results will be made available to Congressional Committees and others as soon as the new studies are completed.

In January, the Department of the Interior released a new report, "Economic Analyses of Fossil Fuels Markets Using Parametric Models," which is helpful in evaluating the complex price-supply-demand interrelationships among natural gas and other fossil fuels, but it does not attempt to answer the question raised in your letter. In the Interior Department's report, the crucial elasticity responses are treated as "exogenous model variables," which means that they were not estimated but were instead represented by an arbitrarily assumed range of values.

Your request also calls for an estimate of what the projected price changes will mean in terms of increased cost to the average homeowner who uses natural gas. One such estimate was made by Foster Associates, Inc., in a report entitled, "The Impact of Deregulation of Natural Gas Prices" (August 1973) prepared for the American Petroleum Institute. In a letter dated October 3, 1973, to Congressman Les Aspin, I forwarded detailed comments by the Commission's Bureau of Natural Gas and Office of Economics on that report. A copy of that letter is enclosed herewith. An important point to note concerning the Foster Associates report is that it does not consider the cost increases for the three-fourths of gas production that is consumed by commercial, industrial, and utility customers. In all likelihood, these cost increases will be passed forward in higher prices for goods and services generally. In other words, the largest part of the higher cost of natural gas to the typical homeowner will be hidden in the prices paid for other things rather than added to the homeowner's gas bill.

The staff is currently compiling data from the monthly curtailment reports submitted for the last quarter of 1973. Revised Schedules 1 through 5 of Table 1 reflecting this information will be forwarded to your office as soon as possible. An identical letter has been sent to Senator Russell B. Long.

Sincerely,

JOHN N. NASSIKAS, *Chairman.*

Enclosures:

1. Table I—Net Curtailments by State and Intercompany Curtailments (November 1970 through September 1973).
2. Table II—Projected Curtailments (September 1973 through September 1974).
3. FPC Form 16 (Gas Supply and Requirements).
4. FPC Form 17 (Monthly Report of Natural Gas Pipeline Curtailments).
5. October 3, 1973 letter to Congressman Aspin.



Table I  
Schedule 1  
Sheet 1 of 2

State	Total Curtailment Less Intercompany Curtailment									
	Year 1970		Year 1971		Year 1972		Year 1973		9 Months	
	During Year	Cumulative From 10-31-70	During Year	Cumulative From 10-31-70	During Year	Cumulative From 10-31-70	During Year	Cumulative From 10-31-70	During Year	Cumulative From 10-31-70
Alabama	893,394	893,394	9,403,009	10,296,403	28,689,872	38,986,275	22,729,921	61,716,196	22,729,921	61,716,196
Arizona			3,346,203	3,346,203	10,998,271	14,344,474	22,077,324	36,421,798	22,077,324	36,421,798
Arkansas			55,119,033	63,390,106	94,837,199	158,227,305	92,462,670	250,689,975	92,462,670	250,689,975
California					12,927,156	12,927,156	54,472,330	67,399,486	54,472,330	67,399,486
Colorado										
Connecticut			166,280	166,280	1,413,877	1,578,157	1,452,975	3,031,132	1,452,975	3,031,132
Delaware			26,288	26,288	-	26,288	2,970	29,258	2,970	29,258
Florida	731,325	731,325	7,935,372	8,666,697	20,133,362	28,800,059	17,745,913	46,545,972	17,745,913	46,545,972
Georgia	855,886	855,886	12,473,700	13,329,586	3,542,283	16,871,869	3,556,464	20,428,333	3,556,464	20,428,333
Idaho										
Illinois			71,950,121	71,950,121	127,785,106	199,735,227	175,398,801	375,134,028	175,398,801	375,134,028
Indiana			18,158,060	18,158,060	47,483,645	65,611,705	76,494,151	142,105,856	76,494,151	142,105,856
Iowa			2,261,563	2,261,563	4,102,224	6,363,787	4,753,680	11,117,467	4,753,680	11,117,467
Kansas	22,042	22,042	159,320	181,362	341,261	522,623	274,061	796,684	274,061	796,684
Kentucky			13,953	13,953	208,022	221,975	46,750	268,725	46,750	268,725
Louisiana	4,010,028	4,010,028	38,298,903	42,308,931	125,495,919	167,804,850	147,148,338	314,953,188	147,148,338	314,953,188
Maine										
Maryland			5,094	5,094	272	5,366	412	5,778	412	5,778
Massachusetts			342,281	342,281	2,946,703	3,288,984	3,027,458	6,316,442	3,027,458	6,316,442
Michigan			9,009	9,009	1,014,697	1,023,706	1,888,392	2,912,098	1,888,392	2,912,098
Minnesota			115,719	115,719	1,085,719	1,211,438	718,541	1,929,979	718,541	1,929,979
Mississippi	1,560,079	1,560,079	12,826,108	14,386,187	42,904,224	57,290,411	67,012,069	126,302,480	67,012,069	126,302,480
Missouri			36,372	36,372	2,496,859	2,533,231	4,769,640	7,302,871	4,769,640	7,302,871
Montana										
Nebraska			58,458	58,458	1,011,085	1,069,543	849,535	1,919,078	849,535	1,919,078
Nevada										
New Hampshire										
New Jersey	857,764	857,764	12,479,720	13,337,484	27,665,443	41,002,927	33,283,210	74,286,137	33,283,210	74,286,137
New Mexico			691,942	691,942	1,645,662	2,337,604	4,929,172	7,266,776	4,929,172	7,266,776
New York	161,670	161,670	13,962,986	14,124,656	26,231,284	40,355,940	31,237,505	71,613,445	31,237,505	71,613,445
North Carolina	62,872	62,872	9,644,685	9,707,557	16,428,458	26,136,015	16,501,287	42,637,302	16,501,287	42,637,302
North Dakota										
Ohio			36,675	36,675	1,394,635	1,431,310	1,922,406	3,353,716	1,922,406	3,353,716
Oklahoma	24,582	24,582	203,677	228,259	573,150	801,409	372,887	1,174,296	372,887	1,174,296
Oregon										
Pennsylvania			9,369,289	9,369,289	26,281,179	35,650,468	33,849,037	69,499,495	33,849,037	69,499,495
Rhode Island			79,204	79,204	678,265	757,469	698,402	1,455,871	698,402	1,455,871

Net Curtailments By State  
And Intercompany Curtailments,\*  
(Cont'd)

State	Total Curtailment Less Intercompany Curtailment											
	Year 1970			Year 1971			Year 1972			Year 1973 (9 Months)		
	During Year	Cumulative From 10-31-70	During Year	Cumulative From 10-31-70	During Year	Cumulative From 10-31-70	During Year	Cumulative From 10-31-70	During Year	Cumulative From 10-31-70	During Year	Cumulative From 10-31-70
South Carolina			1,567,448	1,567,448	3,241,478	4,808,926	2,865,851	7,674,777				
South Dakota			8,347	8,347	21,225	29,572	24,389	53,961				
Tennessee			52,543	52,543	793,877	846,420	61,727	908,147				
Texas	84,041	84,041	2,793,551	2,877,592	9,785,891	12,663,483	12,097,000	24,760,483				
Utah												
Vermont			2,777,691	2,777,691	5,173,141	7,950,832	5,150,192	13,101,024				
Virginia												
Washington			34,289	34,289	118,836	153,125	52,302	205,427				
West Virginia												
Wisconsin												
Wyoming												
<b>Total-Net</b>	<b>17,534,756</b>	<b>17,534,756</b>	<b>286,404,893</b>	<b>303,939,649</b>	<b>649,430,280</b>	<b>953,369,929</b>	<b>839,954,374</b>	<b>1,793,324,303</b>				
<b>Intercompany Curtailment*</b>	<b>3,030,395</b>	<b>3,030,395</b>	<b>64,518,474</b>	<b>67,548,869</b>	<b>261,235,498</b>	<b>328,784,367</b>	<b>275,660,209</b>	<b>604,444,576</b>				
<b>Total</b>	<b>20,565,151</b>	<b>20,565,151</b>	<b>350,923,367</b>	<b>371,488,518</b>	<b>910,665,778</b>	<b>1,282,154,296</b>	<b>1,115,614,583</b>	<b>2,397,768,879</b>				

Table I  
Schedule 1  
Sheet 2 of 2

\*Curtailment of other pipeline transmission companies.  
Source: Monthly Form 17 reports filed with the Federal Power Commission by interstate pipeline companies.

Table I  
Schedule 2Curtailments During Year 1970  
(Firm Volumes-Mcf)

State	Pipeline					State Total
	Arkansas Louisiana Gas Co.	Louisiana- Nevada Transit Co.	Mid- Louisiana Gas Co.	Transconti- nental Gas P/L Corp.	United Gas Pipe Line Co.	
Alabama					893,394	893,394
Arizona						
Arkansas	8,205,173	65,900				8,271,073
California						
Colorado						
Connecticut						
Delaware						
Florida					731,325	731,325
Georgia				855,886		855,886
Idaho						
Illinois						
Indiana						
Iowa						
Kansas	22,042					22,042
Kentucky						
Louisiana	1,652,780		11,800		2,345,448	4,010,028
Maine						
Maryland						
Massachusetts						
Michigan						
Minnesota						
Mississippi			18,200		1,541,879	1,560,079
Missouri						
Montana						
Nebraska						
Nevada						
New Hampshire						
New Jersey				857,764		857,764
New Mexico						
New York				161,670		161,670
North Carolina				62,872		62,872
North Dakota						
Ohio						
Oklahoma	24,582					24,582
Oregon						
Pennsylvania						
Rhode Island						
South Carolina						
South Dakota						
Tennessee						
Texas	29,821				54,220	84,041
Utah						
Vermont						
Virginia						
Washington						
West Virginia						
Wisconsin						
Wyoming						
Total-Net	9,934,398	65,900	30,000	1,938,192	5,566,266	17,534,756
Intercompany Curtailment*	25,625	-	-	-	3,004,770	3,030,395
Total	9,960,023	65,900	30,000	1,938,192	8,571,036	20,565,151

\*Curtailment of other pipeline transmission companies.

Source: Monthly Form 17 reports filed with the Federal Power Commission by interstate pipeline companies.



Curtailments During Year 1971  
(Cont'd)

STATE	Pipeline													State Total
	Algonquin Gas Trans. Co.	Arkansas Louisiana Gas Co.	Eastern Shore Natural Gas Co.	El Paso Natural Gas Co.	Louisiana- Nevada Transit Co.	Louisiana Gas Co.	Mid- Louisiana Gas Co.	Natural Gas Co. of Amer.	Northern Natural Gas Co.	Texas Eastern Trans. Corp.	Transconti- ental Gas P/L Corp.	Trunkline Gas Co.	United Gas Pipe Line Co.	
Rhode Island	79,204													79,204
South Carolina														1,567,448
South Dakota								8,347				974		8,347
Tennessee		736,525							51,569					52,543
Texas				874,355										1,180,671
Utah														2,793,531
Vermont														
Virginia														
Washington														
West Virginia														
Wisconsin														
Wyoming														2,777,691
Total-Net	603,788	61,532,336	30,130	4,912,500	182,500	0	88,314,115	379,615	1,755,163	60,982,000	3,583,658	63,909,086	286,404,893	
Intercompany Curtailments	-	9,418,325	-	-	-	-	2,120,964	-	2,415,298	4,807,225	3,809,196	41,947,466	64,518,474	
Total	603,788	70,970,663	30,130	4,912,500	182,500	0	90,635,079	379,615	4,170,461	65,789,225	7,392,854	105,856,552	350,923,367	

Table I  
Schedule 3  
Sheet 2 of 2

Curtailment of other pipeline transmission companies.  
Source: Monthly Form 17 reports filed with the Federal Power Commission by interstate pipeline companies.



Current Liabilities During Year 1973  
(Firm Volume-NEF)

State	Altoona Co.	Arkansas Co.	Eastern Shore Co.	Illinois Co.	Louisiana Co.	Mid-Texas Co.	Mississippi Co.	Northern Co.	Transcontinentals Co.	Transcontinental Gas Pipeline Co.	Transcontinental Gas Pipeline Co.	Transcontinental Gas Pipeline Co.	Watership Co.	Watership Co.	Watership Co.	Watership Co.
Alabama																
Arizona																
Arkansas	91,913,731				310,700											
California																
Colorado																
Connecticut																
Delaware																
Florida																
Georgia																
Illinois																
Indiana																
Iowa																
Kentucky																
Louisiana																
Maine																
Massachusetts																
Michigan																
Minnesota																
Mississippi																
Missouri																
Montana																
Nebraska																
Nevada																
New Hampshire																
New Jersey																
New Mexico																
New York																
North Carolina																
North Dakota																
Oklahoma																
Oregon																
Rhode Island																
South Carolina																
South Dakota																
Tennessee																
Texas																
Vermont																
Virginia																
Washington																
West Virginia																
Wisconsin																
Wyoming																
Total-NEF	5,338,326	104,333,958	3,382	86,494,215	319,900	314,500	5,831,162	194,246,255	3,306,598	10,759,621	44,011,740	86,791,928	577,022	49,343,920	246,104,847	839,954,374
Intercompany																
Current Liab.																
Total	5,338,326	117,901,119	3,382	86,523,669	319,900	314,500	5,831,162	199,055,374	3,368,242	11,784,274	114,000,946	90,204,700	1,713,437	102,202,195	298,054,197	1,115,616,568

Table I  
Schedule 5

\*Current Liabilities of other pipeline transmission companies.  
Source: Monthly Form 17 reports filed with the Federal Power Commission by interstate pipeline companies.

Table II  
Schedule I

**PROJECTED CURTAILMENTS**  
**September 1973 Thru August 1974**  
**Reported by Major Pipeline Companies**  
**Filing Form 16 Reports**  
**(Million Cubic Feet at 14.73 Psia)**

<u>Pipeline Company</u>	<u>Projected Curtailments*</u>		
	<u>Firm</u>	<u>Interruptible</u>	<u>Total</u>
Algonquin Gas Transmission Co.	11,815	11,815	23,630
Arkansas Louisiana Gas Co.	149,622	23,183	172,805
Cities Service Gas Co.	52,849	-0-	52,849
Colorado Interstate Gas Co.	-0-	-0-	-0-
Columbia Gas Transmission Corp.	59,509	-0-	59,509
Consolidated Gas Supply Corp.	29,875	-0-	29,875
East Tennessee Natural Gas Co.	-0-	-0-	-0-
El Paso Natural Gas Co.	243,964	37,427	281,391
Florida Gas Transmission Co.	-0-	46,038	46,038
Granite State Gas Transmission, Inc.	-0-	168	168
Great Lakes Gas Transmission, Inc.	-0-	-0-	-0-
Kansas-Nebraska Natural Gas Co., Inc.	-0-	-0-	-0-
Michigan Wisconsin Pipe Line Co.	-0-	-0-	-0-
Midwestern Gas Transmission Corp.	-0-	-0-	-0-
Mid Louisiana Gas Co.	-0-	-0-	-0-
Mississippi River Transmission Corp.	11,248	84,680	95,928
Montana Dakota Utilities Co.	-0-	120	120
Natural Gas Pipeline Co. of America	210,195	-0-	210,195
Northern Natural Gas Co.	6,163	-0-	6,163
Pacific Gas Transmission Co.	-0-	-0-	-0-
Panhandle Eastern Pipe Line Co.	56,909	17,391	74,300
South Georgia Natural Gas Co.	-0-	6,661	6,661
Southern Natural Gas Co.	-0-	131,813	131,813
Tennessee Gas Pipeline Co.	-0-	-0-	-0-
Texas Eastern Transmission Corp.	181,169	-0-	181,169
Texas Gas Transmission Corp.	16,412	1,349	17,761
Transcontinental Gas Pipe Line Corp.	189,077	-0-	189,077
Transwestern Pipeline Co.	27,298	-0-	27,298
Trunkline Gas Co.	194,190	-0-	194,190
United Gas Pipe Line Co.	561,456	-0-	561,456
<b>Total</b>	<b>2,001,751</b>	<b>360,645</b>	<b>2,362,396</b>

\* Includes Intercompany Curtailments.



Table II  
Schedule 2

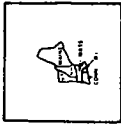
Reporting Company	Region Served by Company									
	1	2	3	4	5	6	7	8	9	10
Algonquin	X	X								
Arkansas Louisiana Gas Company					X	X	X			
Cities Service Gas Company					X	X	X	X		
Colorado Interstate Gas Company						X	X			
Columbia Gas Systems, Inc.		X								
Consolidated Gas Supply Corporation		X					X			
East Tennessee Natural Gas Company		X	X							
Eastern Shore Natural Gas Company		X								
El Paso Natural Gas Company						X	X	X	X	X
Florida Gas Transmission Company			X				X			
Granite State Gas Transmission, Inc.	X									
Great Lakes Gas Transmission Company				X	X	X	X	X		
Kansas-Nebraska Natural Gas Company, Inc.					X	X	X			
Louisiana-Neveda Transit Company		X	X	X	X	X	X			
Michigan Wisconsin Pipeline Company		X	X	X	X					
Midwestern Gas Transmission Corporation		X	X	X	X					
Mid Louisiana Gas Company										
Mississippi River Transmission Corporation				X	X	X	X	X		X
Montana-Dakota Utilities Company										
Mountain Fuel Supply Company										
Natural Gas Pipeline Company of America				X	X	X	X	X	X	X
Northern Natural Gas Company				X	X	X	X	X	X	X
Pacific Gas Transmission Company				X	X	X	X	X	X	X
Panhandle Eastern Pipeline Company										
South Georgia Natural Gas Company		X		X		X				
Southern Natural Gas Company			X							
Tennessee Gas Pipeline Company		X	X							
Texas Eastern Transmission Corporation		X	X	X		X				
Texas Gas Transmission Corporation		X	X	X						
Transcontinental Gas Pipe Line Corporation		X	X	X						X
Transwestern Pipeline Company						X				
Trunkline Gas Company			X	X						
United Gas Pipe Line Company			X							

Note: Some companies may have minor service in some areas not designated in this schedule.

**Regions by FRC**

REGION 1

Connecticut, Maine, Massachusetts,  
New Hampshire, Rhode Island, Vermont



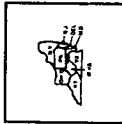
REGION 6

Kansas, Missouri, Oklahoma



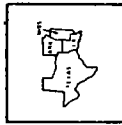
REGION 2

Delaware, Kentucky, Maryland, New Jersey,  
New York, Virginia, West Virginia  
Ohio, Pennsylvania.



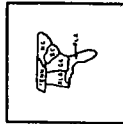
REGION 7

Arkansas, Louisiana, Mississippi,  
Texas



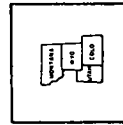
REGION 3

Alabama, Florida, Georgia, North Carolina,  
South Carolina, Tennessee



REGION 8

Colorado, Montana, Utah, Wyoming



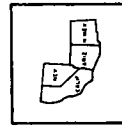
REGION 4

Illinois, Indiana, Michigan, Wisconsin



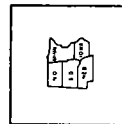
REGION 9

Arizona, California, Nevada,  
New Mexico



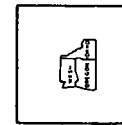
REGION 5

Iowa, Minnesota, Nebraska, North Dakota, South Dakota



REGION 10

Idaho, Oregon, Washington



FPC Form 16  
Gas Supply and Requirements  
Instructions for Reporting

1. On or before April 30, and September 30 of each year report as provided in the attached form the volumes of gas as set forth in Schedules I through IV. Report in the April 30 filing actual volumes for the past year, April through March and projected data for one year April through March. Report in the September 30 filing actual volumes for the past year, September through August and projected data for one year September through August. Report the coincidental peak day of maximum requirements for the reporting period. Projections shall be based on weather conditions normally anticipated. State such weather conditions including the design temperature.
2. An original and three copies of the report shall be filed with the Commission. Address the report to the Secretary, Federal Power Commission, 825 North Capitol Street, N. E., Washington, D. C. 20426.

FORM APPROVED  
OCT 54-80101

### REPORT OF GAS SUPPLY AND REQUIREMENTS - SCHEDULE NO. 1 - Summary

FEDERAL POWER COMMISSION  
Washington D. C. 20426

COMPANY NAME \_\_\_\_\_ COMPANY CODE NO. \_\_\_\_\_ PERIOD COVERED APRIL 1, 19\_\_\_\_ to MARCH 31, 19\_\_\_\_  
SEPTEMBER 1, 19\_\_\_\_ to AUGUST 31, 19\_\_\_\_

**GENERAL INSTRUCTIONS:**

1. An original and three copies of this report shall be sent to the Secretary, Federal Power Commission, Washington, D. C. 20426, before the 30th of April and the 30th of September.
2. Report in the April 30th filing actual volumes for the past year, April through March, and projected data for one year April through March.
3. Report in the September 30th filing actual volumes for the past year, September through August, and projected data for one year, September through August.
4. Report the coincidental peak day of maximum requirements for the reporting period.
5. This report consists of two sets of Schedules. Schedule 1 contains Actual Volumes and the other Projected Volumes.
6. Report all Volumes at 14.73 psia at 60°F.
7. Schedule references SA, SD, and SE apply to Peak Day.
8. On page 2 report only peak day figures in Col. (h).

LINE NO.	SUPPLY (a)	ACTUAL TOTAL GAS SUPPLY UNITS (AVERAGE)												ANNUAL TOTAL (b+c)	PEAK DAY (c)			
		September	October	November	December	January	February	March	April	May	June	July	August					
01	Net Present Supply (Schedule No. 2, Line 35).....																	
02	Anticipated New Supply* (Total from Attachment B).....																	
03	Authorized Emergency Reserve** (18 CFR 2.70).....																	
04	Exempted Purchases (18 CFR 2.66, 157-22-157.25).....																	
05	SUB-TOTAL (Lines 1 - 4).....																	
06	Normally Anticipated Loss of Supply (Contingency).....																	
07	Company Use and Shrinkage.....																	
08	Exchange Gas Used.....																	
09	Storage, (injection) or Withdrawals (Schedule 4, Line 3).....																	
10	NET AVAILABLE FOR MAIN LINE (Line 05 - 09).....																	
11	Adjustment (Explain)																	
12	AVAILABLE FOR MARKET (Line 10 Less Adjustments).....																	
13	Firm Requirements (Schedule No. 3, Line 9).....																	

Attach Explanation (List Bucket Number and Supplier) to provide Separate Listing by Bucket Number and/or name of Supplier.

COMPANY NAME		PERIOD												
		APRIL 1, 19____ TO MARCH 31, 19____				APRIL 1, 19____ TO AUGUST 31, 19____				SEPTEMBER 1, 19____ TO AUGUST 31, 19____				
Line No.	REQUIREMENTS (Mscf)	MISC. ACTUAL REQUIREMENTS												
		Apr. 1 September (b)	May October (c)	June November (d)	July December (e)	August January (f)	September February (g)	October March (h)	November April (i)	December May (j)	January June (k)	February July (l)	March August (m)	Peak Day (n)
<b>FIRM REQUIREMENTS:</b>														
1	Deliveries													
2	Average Day													
3	Monthly													
	Cumulative													
4	Curtailment													
5	Average Day													
6	Monthly													
7	Cumulative													
<b>INTERRUPTIBLE MARKETS</b>														
8	Deliveries													
9	Average Day													
10	Monthly													
11	Cumulative													
12	Curtailment													
13	Average Day													
14	Monthly													
15	Cumulative													
<b>CURTAILMENT OF PIPELINE TO PIPELINE SALES*</b>														
16	Firm Curtailment													
17	Average Day													
18	Monthly													
19	Cumulative													

\* Provide Separate Listing by Pipeline Company  
 \*\* Curtailment of interruptible market should be based on reductions in normal deliveries to the attached interruptible load of the reporting pipeline.





REPORT OF GAS SUPPLY AND REQUIREMENTS - SCHEDULE NO. 1 - Summary

GENERAL INFORMATION  
 COMPANY NAME: \_\_\_\_\_ COMPANY CODE NO. \_\_\_\_\_ PERIOD COVERED: APRIL 1, 19\_\_\_\_ TO MARCH 31, 19\_\_\_\_  
 SEPTEMBER 1, 19\_\_\_\_ TO AUGUST 31, 19\_\_\_\_

GENERAL INSTRUCTIONS  
 1. An original and three copies of this report shall be sent to The Secretary, Federal Power Commission, Washington, D. C. 20426, on or before the 30th of April and the 30th of September.  
 2. Report in the April 30th filing actual volumes for the past year, April through March, and projected data for one year April through March.  
 3. Report in the September 30th filing actual volumes for the past year, September through August and projected data for one year, September through August.  
 4. Report the coincidental peak day of maximum requirements for the reporting period.  
 5. This report consists of two sets of Schedules. They are similar, except that one is Actual Volumes and the other Projected Volumes.  
 6. Report all Volumes at 14.75 paise at 60°F.  
 7. Schedule references **SD** and **PI** apply to Peak Day.  
 8. On page 2 report only peak day figures in Col. (r).

LINE NO.	SUPPLY	PROJECTED TOTAL GAS SUPPLY (IN CUMULATIVE AVERAGE)												ANNUAL TOTAL (Mscf) (n)	PEAK DAY (c)		
		April September	May October	June November	July December	August January	September February	October March	November April	December May	January June	February July	March August				
C1	Net Present Supply (Schedule No. 2, Line 25)																
02	Anticipated New Supply* (Total from Attachment)																
03	Authorized Emergency Purchases** (18 CFR 2.76)																
04	Swapped Purchases** (18 CFR 2.68, 157.22-157.29)																
05	SUB-TOTAL (Lines 1 - 4)																
06	Normally Anticipated Loss of Supply (Contingency)																
07	Company Use and Shrinkage																
08	Exchange Gas Order																
09	Storage (Injection) or Withdrawal (Schedule 4, Line 2)																
10	NET AVAILABLE FOR MAIN LINE (Lines 05 - 09)																
11	Adjustment (Explain)																
12	AVAILABLE FOR MARKET (Line 10 Less Adjustment)																
13	Fire Requirements (Schedule No. 3, Line 8)																

\* Attach Explanation (List Ticker, Number and Supplier)  
 \*\* Provide Separate Listing by Ticker Number and/or Name of Supplier.  
 \*\*\* Projections shall be based on weather conditions normally anticipated. State in separate listing such weather conditions including the design temperature.  
 FPC Form 16 (7-73)



REPORT OF GAS SUPPLY AND REQUIREMENTS - SCHEDULE NO. 1 - Summary (Continued)

COMPANY NAME		PERIOD COVERED												PEAK DAY			
		APRIL 1, 19__ TO MARCH 31, 19__						SEPTEMBER 1, 19__ TO AUGUST 31, 19__									
Line No.	REQUIREMENTS (Mcf)	SMC/G PROJECTED REQUIREMENTS												March (e)	August (e)		
		April (b)	September (c)	October (c)	May (d)	November (d)	December (d)	January (e)	February (e)	March (e)	April (e)	May (e)	June (e)			July (e)	August (e)
<b>FIRM REQUIREMENTS:</b>																	
1	Deliveries																
2	Average Day																
3	Monthly																
	Cumulative																
<b>Deficiencies</b>																	
4	Average Day																
5	Monthly																
	Cumulative																
<b>INTERRUPTIBLE MARKETS</b>																	
16	Deliveries																
17	Average Day																
18	Monthly																
19	Cumulative																
<b>see Curtailments</b>																	
20	Average Day																
21	Monthly																
22	Cumulative																
<b>CURTAILMENT OF PIPELINE TO PIPELINE SALES*</b>																	
<b>Firm Curtailments</b>																	
13	Average Day																
14	Monthly																
15	Cumulative																
<b>see Interruptible Curtailments</b>																	
16	Average Day																
17	Monthly																
18	Cumulative																

\* Provide Separate Listing by Pipeline Company  
 \*\* Curtailment of interruptible market should be based on reductions in normal deliveries to the attached interruptible load of the reporting pipeline.



REPORT OF GAS SUPPLY AND REQUIREMENTS - SCHEDULE NO. 3 - Firm Requirements

Line No.	ITEM	PERIOD COVERED																
		APRIL 1, 19__ to MARCH 31, 19__						SEPTEMBER 1, 19__ to AUGUST 31, 19__										
PROJECTED REQUIREMENTS (AVERAGE)		April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August
FIMS:		(a)	(c)	(e)	(g)	(i)	(k)	(m)	(o)	(q)	(s)	(u)	(w)	(y)	(aa)	(ac)	(ad)	(ae)
01	Full Requirements																	
02	Partial Requirements																	
03	Storage Services Types																	
04	Other Firm Services (Specify)																	
05	SUB-TOTAL (Lines 01 through 04)																	
06	Adjustments not shown on other Schedules																	
07	SUB-TOTAL (Line 06)																	
08	TOTAL (Lines 05 - 07)																	

SCHEDULE NO. 4 - Storage Operations

Line No.	FIELD NAMES (FPC Field Code)	PROJECTED INJECTIONS (WITHDRAWS) (AVERAGE)																
		April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August
		(a)	(c)	(e)	(g)	(i)	(k)	(m)	(o)	(q)	(s)	(u)	(w)	(y)	(aa)	(ac)	(ad)	(ae)
01	01 FIELD NAMES (FPC Field Code)																	
02	SUB-TOTAL (Line 01)																	
03	ADJUSTMENTS (Changes in base storage, development of Res Zones, etc.)																	
04	SUB-TOTAL (Line 03)																	
05	TOTAL (Lines 02 - 04)																	

FEDERAL POWER COMMISSION Washington, D. C. 20426	<b>MONTHLY REPORT OF NATURAL                  GAS PIPELINE CURTAILMENTS</b>	Form Approved OMB No. 54R0099
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**GENERAL INSTRUCTIONS:**

1. An original and one conformed copy of this report shall be sent to The Secretary, Federal Power Commission Washington, D. C. 20426, on or before the 15th day of the month following the reporting month.
2. Report all volumes in Mcf at 14.73 psia at 60° F.

1. Reporting Company	2. Report for the month of <b>19</b>	
3. Company Address	4. Page No. of	
5. Date curtailment commenced	6. Duration of curtailment in days	7. Base from which volume curtailed was determined (Contract demand, entitlement, maximum day, etc.)
8. State the names of any jurisdictional companies who curtailed the respondent during the reporting month		9. Duration of curtailment in days

10. Enter the Rate Schedule, Name and Volume curtailed for each customer affected by the curtailment.

1. Group separately (a) Jurisdictional Customers; (b) Non-Jurisdictional Customers.
2. Indicate Non-Jurisdictional Firm Customers by placing an X in column (d).
3. Indicate Non-Jurisdictional Interruptible Customers by placing an X in column (e).

Line No.	RATE SCHEDULE (a)	CUSTOMER NAME (b)	VOLUME CURTAILED (c)	FIRM (d)	INTER-RUPTIBLE (e)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

(Continued on Reverse)

Type name of person preparing report	Signature of preparer	Date
Business address		Telephone (Area code, No., Ext.)

Continuation sheet for Item Number 10, page 1					
Line No.	RATE SCHEDULE (a)	CUSTOMER NAME (b)	VOLUME CURTAILED (c)	FIRM (d)	INTER-RUPTIBLE (e)
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					

(Use blank sheets if additional space is needed)

FEDERAL POWER COMMISSION,  
Washington, D.C., October 3, 1973.

Congressman LES ASPIN,  
House of Representatives,  
Washington, D.C.

DEAR CONGRESSMAN ASPIN: In response to your request of September 10, 1973, the Staff of the Federal Power Commission has analyzed the Foster Associates' report for the American Petroleum Institute entitled "The Impact of Deregulation on Natural Gas Prices." An analysis of that report, prepared by the Commission's Bureau of Natural Gas and Office of Economics, is enclosed herein.

With respect to your request that this Commission "estimate exactly what the effects of deregulation would be", and the "average price per Mcf in 1974, 1975, 1976, and 1980", no such precision is possible. There have been studies prepared indicating supply elasticities ranging from 0.4 to 0.7;<sup>1</sup> however, such studies represent only estimates of the responsiveness of gas supplies to given price changes. The Commission's National Gas Survey will further examine the interrelationships of prices, supply and demand.

Sincerely yours,

JOHN N. NASSIKAS, *Chairman.*

Enclosure No. 095253.

FEDERAL POWER COMMISSION STAFF COMMENTS ON "THE IMPACT OF DEREGULATION ON NATURAL GAS PRICES," A REPORT FOR THE AMERICAN PETROLEUM INSTITUTE BY FOSTER ASSOCIATES, INC.

The stated purpose of the API study is to estimate future increases in burner tip prices at various wellhead prices under alternative deregulation assumptions. These assumptions, or cases, are: (1) deregulation of all sales, (2) deregulation of new sales and existing sales in phases over a four-year period, (3) deregulation of new sales and expired contracts (the administration proposal), and (4) deregulation of new sales only. The Study does not attempt to measure the "costs" of continuing existing FPC price ceilings. Rather, it states the broad assumption that in the event of continuation of existing price ceilings, "we may anticipate" further declines in exploration and drilling activity, and a further dwindling of reserve additions with a concomitant worsening of our reserve inventory position. In addition, the Study's authors postulate that a continuing gas supply shortage will increase consumer cost in any event due to the normal replacement of old gas by higher-priced new gas as old contracts expire, because of the purchase of high-priced alternatives to fill the supply gap, and because of higher pipeline costs associated with excess capacity due to curtailed gas supplies.

With regard to the assumption of continuing existing FPC ceiling prices, it should be noted that the FPC has instituted numerous steps in the past several years to increase exploration and development and the dedication of new gas supplies to the interstate market, and to alleviate short-term gas shortage emergencies. Most notable among these steps are Order No. 431 of April 15, 1971, which, among other things, provided for limited-term gas purchase certificates with pregranted abandonment to sellers; notice of proposed rulemaking in Docket No. R-389B, issued on April 11, 1973, which seeks to establish a national new gas rate; and notice of proposed rulemaking in Docket No. R-478, issued on May 23, 1973, which proposes a single uniform rate for flowing gas for all producing areas on a nationwide basis. To the extent that these programs have and will increase wellhead price and supply, the Study's base case of "continuing existing FPC price ceilings" is not appropriate. Therefore, the consumer price impact resulting from the various deregulation alternatives examined in the Study may be overstated because of the price effects of the above-described FPC actions. On the other hand, to the extent that high-priced alternatives to natural gas will be needed in addition to any supplies forthcoming from deregulation, and excess pipeline capacity and some unfilled consumer demands persist, the consumer price impacts are understated.

The methodology used in the Study was to examine a sample of existing gas purchase contracts to obtain pricing and volume data for this segment of gas supply in any given year, and to add in estimated new volumes of gas each year at the various deregulated price levels postulated in the Study. This procedure was modified as necessary to conform to the deregulation alternatives which were

<sup>1</sup> United States Department of the Interior, "Draft Environmental Impact Statement, Proposed Deregulation of Natural Gas Prices, July 17, 1973, Appendix B, p. 29.

examined. Specifically, the Study utilized volume and price data for existing sales based on a detailed analysis of 1,461 contracts in effect as of January 1, 1973, with 1971 sales of at least 2 billion cubic feet, or contracts dated after December 31, 1971, with estimated sales of 2 billion cubic feet. This sample, the Study asserts, represents 70 percent of interstate gas deliveries in 1971. With regard to new supply, the Study made the assumption that annual additions would increase from the present level of about 10 trillion cubic feet (Tcf) to about 19 Tcf in 1975 and 27 Tcf in 1980. It is stated that this estimate was taken from the National Petroleum Council's Case II projection<sup>2</sup> which is predicated on a 3.5 percent per annum increase in the drilling rate and a finding rate 50 percent greater than in the past. About 62 percent of new reserve additions are estimated by the Study to go to the interstate market, and the production rate would be about 7.5 percent of reserves annually. Additionally, old volumes plus new volumes are projected to result in fairly stable production through 1976, and increase thereafter by about 2 percent per annum.

The procedure of analyzing gas purchase contracts for pricing provisions and annual volume levels is the standard approach in a study of this type. The 2 Bcf cut-off volume is reasonable, and the resulting 70 percent volume coverage is good. The FPC has not recently done a study of this type, but will in the next few months be compositing similar data to be submitted by respondents to the Commission's rulemaking proceeding in Docket No. R-478. The projection of new supply is, of course, speculative, and is conspicuous in the instant study since it is the only projection of future supply offered, no matter what deregulated price (45¢ to 75¢) is assigned at the wellhead. In other words there is no set of supply responses to the range of wellhead prices postulated, the very type of information that is most sought after in this area. In fact, the authors state that "the study did not measure or purport to measure the elasticity of gas supply with respect to price." The level of annual additions forecast is optimistic in view of recent history (10 Tcf per year over the last 5 years). The 27 Tcf level in 1980 exceeds the all-time record of 24.7 Tcf for the lower 48 states in 1956. The proportion of interstate sales (62 percent) is reasonable, but the projected levels of interstate production (Study, Appendix A, Table 5) are below the 1972 level of 14.1 Tcf until 1979, a very pessimistic outlook considering the reserve additions, production, and range of possible wellhead prices that are postulated.

As stated previously the Study makes the assumption that continuation of existing FPC ceiling prices would have its own costs. There is no attempt to measure such costs, an input which would have provided a useful contrast to the deregulation alternatives posed. The authors establish as their basic premise that higher gas prices, other factors unchanged, will induce producers to commit more funds to exploration and to undertake a wider range of exploration prospects. They state that the existence of directionality and the "disparate trends of gas exploration in the decade of the 'fifties and during the sixties' indicate that supply is responsive to price," but they do not provide a measure of the degree of this responsiveness, i.e., of the elasticity of supply with respect to price.

The proposition that supply will respond in a positive way to an increase in price is widely accepted, but the magnitude of the response and the time lag associated with it are issues which are skirted by the use of a single level of projected production. Once having analyzed old contracts and projected this single level of production, the Study merely becomes a mathematical exercise of inserting various wellhead prices in varying mixes of old and new gas, and estimating the effect on the consumer. The authors argue that, at a given wellhead price, should new gas volumes be smaller than projected, the increase in the average price for all gas supplied would be smaller; similarly, a large volume of new gas would result in a higher average price for all gas.

The Study's main conclusions are in the form of increases in the cost of residential gas service under deregulated wellhead prices of 45¢, 55¢, 65¢ and 75¢/Mcf, and under the four deregulation alternatives postulated. At a 55¢ market price (the most frequently cited level in the Study), the projected increase in field prices between 1/1/73 and 1/1/80 is 19.04¢/Mcf if prices for new sales only were deregulated, and 25.18¢/Mcf if all natural gas prices were freed from regulatory controls, either all at once or over a four-year period. Deregulation of new sales and expired contracts, the object of the current administration bill, would result in an increase of 22.95¢/Mcf between 1/1/73 and 1/1/80 under the 55-cent market

<sup>2</sup> National Petroleum Council, *U.S. Energy Outlook*, December, 1972. An examination of the NPC report indicates that the rate of reserve additions used in the API Study corresponds to the most optimistic Case I rather than to Case II. Reserve additions for NPC Case II are 17.3 Tcf in 1975 and 21.8 Tcf in 1980 (NPC Report at page 61, Table 33).

price. (See Appendix A, Table 7-B of the Study). Also at the 55-cent wellhead price, the increase in the average annual gas bill of \$155.73 (1972) would be \$8.30 as of 1/1/74, amounting to an increase about 5 percent, under immediate deregulation of all sales. By 1977, the increase under this alternative would cumulate to \$20.17, and by 1980 to \$33.06. Phasing deregulation of existing sales over a 4-year period would reduce the immediate impact from \$8.30 to \$4.53, but by 1977, the annual increase would be the same as under total deregulation. With only new sales deregulated, the 1/1/74 increase would be \$2.10, rising to \$12.64 by 1977 and to \$25.00 in 1980. (See Appendix A, Table 9-B of the Study.) The authors note with regard to the projected increases that the "baseline," or costs under continued FPC ceilings, increases from 20.48¢/Mcf as of 1/1/73 to 23.50¢/Mcf as of 1980.

An important point to be noted in the API Study is that it seeks to measure only the residential impact of the various deregulation scenarios examined. Because residential customers purchase only about one-fourth of the total amount of gas delivered to ultimate consumers, the cost estimate, being limited to the impact on residential bills, understates the total additional cost that consumers as a whole will pay. As a result of the operation of market forces (or of rate regulation where the utilities are concerned), it must be assumed that the increased gas prices paid by commercial, industrial, and utility customers will be passed forward in higher selling prices for goods and services generally. In all likelihood, therefore, the direct and indirect dollar impact of the higher costs on consumers will be greater than the direct impact alone. Thus, the section of the Study contrasting consumer expenditures for gas service with expenditures for alcoholic beverages, toilet articles, toys, etc., is misleading. By far the largest part of the increased cost of natural gas to the typical family will be hidden in the prices paid for other things.

Other reasons why the cost estimates in the Study probably are understated are: (a) it is assumed that the increases in field prices will be passed through, cent for cent, to ultimate consumers without any mark-up to reflect the higher carrying costs for gas inventories and working capital; (b) no allowance is made for possible price increases for other fuels as demand is diverted from gas to these fuels and also as the restraint of gas prices on the prices of other fuels is relaxed; (c) no allowance is included for possible renegotiation of existing contract prices; and (d) the estimates assume that prices in contracts with area rate clauses will remain at current area ceilings after the ceilings are repealed by legislation.

In summary then, it can be said that the Study does not attempt to predict either the prices that would be negotiated in an unregulated market or the amount of new supply that will be found and developed at a given price level. Thus, the price and cost estimates in the Study are meaningful only in the context of the specific assumptions used for these key variables. Whereas the assumptions on market prices bracket a wide range, the assumption on new gas supplies allows for Moreover, the Study does not examine the economic dislocation that is likely to result from large increases in the price of gas to industrial customers. Those increases will be larger, percentage wise, than those for residential consumers because industrial customers purchase gas at lower prices. Finally, it must be repeated that it is difficult to accept the assumption in the Study that the volume of new gas supplies will be the same irrespective of the level of market prices. If other levels of new gas supply had been considered, it would be shown that the cost would vary over a wide range depending on whether the new gas supplies were smaller or larger than the volumes on which the report's calculation were based.

The criticisms and conclusions contained herein would be substantially the same were this Study directed toward "regulated" prices of 45 to 75 cents/Mcf and the same supply assumptions, with the possible exception that a lower ratio of gas volumes would flow to the interstate market. The Study is, therefore, no evaluation of "deregulation" as such.



## UNITED STATES OF AMERICA FEDERAL POWER COMMISSION

Gas Supply; Practice and Procedure (Disclosure)  
Practice and Procedure (Show Cause)

Before Commissioners: JOHN N. NASSIKAS, *Chairman*; ALBERT B. BROOKE, Jr.,  
RUSH MOODY, Jr., WILLIAM L. SPRINGER, and DON S. SMITH

Docket No. R-405-A

RELIABILITY OF ELECTRIC AND GAS SERVICE

OPINION NO. 687

OPINION AND ORDER REQUIRING PRODUCTION OF GAS RESERVE DATA

(Issued February 4, 1974)

NASSIKAS, *Chairman*:

By order of October 15, 1973, gas producers who had not filed completed questionnaires on uncommitted gas reserves in accordance with the Commission's order of August 1, 1973, in Docket No. R-405 were directed to show cause why they should not be compelled to submit such questionnaires. The order of August 1, 1973, updated a nationwide investigation in which the Commission sought with regard to the natural gas industry to elicit information so as to enable it to assess the adequacy and reliability of the gas supply and its deliverability to meet consumer demands. The order requested gas reserve data identical in form to that previously supplied. It asked a group of named producers, whose individual jurisdictional sales of natural gas totalled in excess of 10 million Mcf annually, to set forth their recoverable reserves of gas by areas as of December 31, 1972, and as of June 30, 1973, as provided in the attached questionnaire. The order explained that because of steps required to be taken by the Commission pursuant to Congressional *subpoena duces tecum* issued June 21, 1973, its treatment of information submitted pursuant to the order could not be accorded the confidentiality previously authorized and honored by the Commission.

2. When it appeared that certain companies had not responded or had declined to provide the requested data, the Commission issued its show-cause order on October 15, 1973, calling upon these companies to show cause why they should not be compelled to submit the completed questionnaire. The Commission again discussed why it was unable to afford confidential status to the information submitted. It concluded that inasmuch as the protection heretofore provided for proprietary data could no longer be assured, it was unable to represent to the respondents that the data submitted would not be made public. It said that the information voluntarily provided by the companies that had responded had been placed in the public files. The Commission provided for a hearing which was held on November 19 and 20, 1973, before Chief Presiding Administrative Law Judge Joseph Zwerdling.

3. At the hearing Staff counsel advised that since the issuance of the show-cause order the number of non-responding companies had been reduced to five: Pennzoil Company, Pennzoil Producing Company (together Pennzoil), Tenneco Oil Company, TransOcean Oil Inc., and King Resources Company. Witnesses appeared for the Staff and discussed the regulatory need for the reserve data, and witnesses appeared for TransOcean, Tenneco and Pennzoil and testified as to the proprietary nature of the reserve data and the harm that would result to the companies, particularly in competition to acquire gas reserves, if the data were made public. After the exchange of briefs the Judge issued his initial decision on December 7, 1973. Exceptions were filed by the Pennzoil companies, Tenneco, TransOcean and King Resources, and a brief opposing exceptions by Staff counsel.

4. The initial decision sets forth the procedural background, discusses the issues and orders the producer respondents to file the completed questionnaire on or before January 7, 1974. In our opinion Chief Judge Zwerdling fully and competently dealt with the issues and reached the correct conclusion. We discuss the issues in accordance with his analysis with additional comments where we think it appropriate. We affirm his findings of fact and conclusions of law except as hereinafter set forth.

#### STATUTORY AUTHORITY

5. Our authority to require the submission of data on uncommitted reserves by the Natural Gas Company respondents here is, in our opinion, well supported by the Natural Gas Act. Section 8(b) provides that the Commission shall have access to the records of natural-gas companies, who shall furnish to the Commission "any information with respect thereto which the Commission may by order require." Section 10(a) provides that every natural-gas company shall file with the Commission such "periodic or special reports" as the Commission may prescribe to assist it in the proper administration of the Act. Section 14(b) provides that the Commission may determine "the adequacy or inadequacy of the gas reserves held or controlled by any natural-gas company, or by anyone on its behalf, including its owned or leased properties or royalty contracts". Under Section 14(c) for the purpose of any investigation under the Act any member of the Commission or any officer designated by it is empowered to require the production of "any books, papers, correspondence, memoranda, contracts, agreements or other records which the Commission finds relevant or material to the inquiry." Under Section 16 "The Commission shall have power to perform any and all acts" and to issue such orders "as it may find necessary or appropriate to carry out the provisions of this act."

6. As we discuss below, the reserve data is necessary to enable us to carry out our authority under the Act in relation to the present and prospective gas shortage problem. We also discuss below why we are directing that the information to be obtained by the questionnaires shall be made public as we are authorized to do by Section 8(b) of the Act.

#### THE "WEIGHING OF INTERESTS" TEST

7. The issue here, the Judge says, is whether the non-complying respondents should be compelled to submit their questionnaire responses where confidentiality is not to be maintained. The factors to be balanced, he adds, are (1) the potential damage to the private proprietary interest of respondents vs. (2) the Commission's public interest need for this data. Tenneco and Pennzoil say that this is an erroneous characterization of the factors to be weighed. They say that the countervailing interest is the public interest in disclosure of the uncommitted reserve data. In our opinion the Judge's analysis of the factors to be balanced is essentially correct for under the circumstances here the public need for the data involves and requires disclosure to the public.

8. The weighing of interests test is demonstrated by *F.C.C. v. Schreiber*, 38 U.S. 279, 298 (1965), as the Judge points out. There a respondent attacked the F.C.C. order on the ground that it required the Company to disclose confidential business information to competitors, but the Court held that respondents had not sustained their burden of demonstrating that the private interest involved outweighed the public interest in disclosure. In an order issued March 2, 1973, in Docket No. R-432<sup>1</sup> the Commission used a "weighing of interests" test. That proceeding involved a Commission order requiring regulated electric utilities to report certain fuel price data on Form 423. Although petitioners argued that if public disclosure of such data were required, they would be at a competitive disadvantage in negotiating contracts and urged that they be permitted to report only average fuel costs, the Commission refused to grant a stay or confidential treatment saying in effect, that, even if injury occurred, petitioners must show that such injury outweighs the public benefit from full disclosure.

9. The weighing of the interests problem was made the subject of the hearing in the present proceeding. In our order of October 15, 1973, we provided that the producers should present evidence in support of their position and members of the Staff of the Commission should submit evidence of public interest requirements relating to disclosing or not disclosing the requested uncommitted reserve data. On the basis of the hearing it is our opinion that the reserve information

<sup>1</sup> *Monthly Report of Cost and Quality of Fuels for Steam Electric Plant—Form 423*, 49 FPC —, Docket No. R-432, issued March 2, 1973.

required by this order should be placed in the public file in the first instance. Witness Allen, Chief of the Commission's Bureau of Natural Gas, testified that it is a matter of fairness to those who are asked to provide the information to let them know the manner in which the information will be disclosed, and that the best way to do this is to make the information public when it is received at the Commission. Accordingly we now affirm what we provided in our order of October 15, 1973:

"(C) For the purposes of this investigation, any responses submitted in compliance herewith shall be made available for inspection or copying by the public. Individual company information received as a result of this continued investigation will not be maintained in confidential status."

10. While we affirm the Judge's finding on the basis of the record that there is a public need for this data, as discussed below, because the information will not be confidential as against Congressional demands, we do not guarantee its confidentiality. To conclude, we believe that the public interest requires that the reserve data shown by each of the respondent producers be placed in our public file where it will be available to the natural gas industry and to Federal and State agencies, as well as to the general public. The public right to the information outweighs the proprietary interest of the respondents.

#### THE COMMISSION'S NEED FOR THE RESERVE DATA

11. The Judge shows that the Commission has already made its determination of the substantial need for this data in the R-405 orders initiating and continuing the survey. He quotes Staff witness Allen on the importance of this information in assisting the Commission to assess the nation's gas supply situation. While only five of the 85 producers have failed to comply, the Judge takes notice that Pennzoil, Tenneco and TransOcean are exploring in the offshore Louisiana area, so that the data is incomplete without the responses from these companies. He finds further that it would be unfair and beyond the discretionary power of the Commission to exempt the non-complying companies on the basis that they are not willing to comply. Tenneco and Pennzoil suggest variously that the data requested is negligible, that new sales are an excellent measure of the effectiveness of the Commission's emergency pricing policies and there was a failure to present evidence on the need for the data from the remaining producers who objected.

12. Witness Allen testified that the reserve information is but one indication among many which will assist the Commission in assessing the nation's gas supply situation. He added that the size and location of these reserves are the key factors which would indicate the amount of uncommitted reserves available for sale in the supply areas. He was also of the opinion that less than 100 percent reporting by the largest producers would detract from the value of the data reported.

13. Staff witness Stevenson, an economist in the Commission's Office of Economics, testified as to the economic importance and necessity of the requested information. He pointed out that the present request for information will update the data obtained from previous questionnaires. Further information, he said, was necessary to assess the extent of the current shortage problem and to permit the Commission to make time series comparisons with the previous responses. While the gas shortage posed both long run and short run problems, he said, data on uncommitted reserves will be useful in determining whether the present shortage is a short term problem and which policies the Commission should follow, and will provide a measure by which the Commission can evaluate the success of its various pricing options.

14. We agree with the views of the Staff witnesses. We emphasize the importance of a series of studies of uncommitted reserves. In accordance with the Notice of and Proposed Rulemaking issued November 4, 1970, in Docket No. 405, 44 FPC 1346, data was required on uncommitted reserves as of December 31, 1969; and November 1, 1970. Our order of September 12, 1972, updated this investigation and required the submission of questionnaires on uncommitted reserves as of December 31, 1971, and June 30, 1972. The present questionnaire will update the reserve data previously required and provide us with reliable information on more recent uncommitted gas reserves as well as showing us the present trend which we can use to appraise the steps that we have taken to relieve the gas shortage. We observe that on the appeal of the first *Southern Louisiana Area Rate Proceeding*<sup>2</sup> the court emphasized the importance of non cost evidence and the

<sup>2</sup> *Austral Oil Co. v. F.P.C.*, 428 F. 2d 407 (CA5 1970), Cert. denied, 400 U.S. 950 (1970).

persuasive influence of the decline in the supply of gas, and in the second *Southern Louisiana Proceeding*<sup>3</sup> we ordered that producers furnish data relating to the volume of uncommitted reserves in Southern Louisiana; and we concluded that the evidence did not show substantial amounts of any uncommitted reserves available for sale in Southern Louisiana.

15. To conclude, in resolving the national energy problem the reserve information is needed by all agencies of government, Federal and State that are concerned with this problem so as to permit them to determine the extent of available reserves to meet demand, and since natural gas is of paramount importance for the economy, the general public should have equal access to this information.

16. As to the arguments that the reserve data from the remaining respondents is unnecessary, we agree that the Judge properly took notice that Pennzoil, Tenneco and TransOcean are very heavily involved in exploratory activities of substantial magnitude in the important offshore Louisiana area, and we affirm his statement that "Under these circumstances it is concluded that uncommitted reserve data which did not include the responses from these companies would be inadequate and unreliable." If the remaining group of producers could avoid complying on the theory that the Commission could get along without their responses, it would be unfair to those who have complied. The companies who have not voluntarily submitted the data should not be permitted to benefit from their non-compliance at the expense of producers who have voluntarily disclosed their uncommitted reserves. To permit the remaining companies not to file would put the Commission in the position of using its powers to give them a competitive advantage over the complying companies that they did not have before any data was collected.

#### POTENTIAL DAMAGE TO PROPRIETARY INTERESTS

17. After quoting from the testimony of Respondents' witnesses, the Judge determined that the most serious concern expressed related not to disclosure of the uncommitted reserves data itself called for by the questionnaire on an area-by-area basis but rather the damage which would result to their proprietary interest if the results of an expected Staff audit of the questionnaire were publicly disclosed. The August 1, 1973, order in R-405 provided that the data upon which the responses were predicated should be made available for audit by the Commission's Staff in the offices of the producers. The Judge pointed out that the Commission had not expressed its view whether the results of any such Staff audits would be publicly disclosed. Therefore he said the only relevant question concerns the potential damage from public disclosure of the questionnaire data on an area-by-area basis, and concluded that the potential damage from this limited type of disclosure would not be of sufficient seriousness or magnitude to override the public interest in disclosure. In the event, he said, that the Commission should decide that a Staff audit should be made and the results be made a part of the public file, concerned producer-respondents would have full opportunity to make representations to the Commission on that specific problem at that time.

18. Tenneco, Transocean and Pennzoil all object to the submission of the data required by the questionnaire on a non-confidential basis. As the Judge sets forth, the testimony of Tenneco's witness Leask, Manager of Production Operations, stated that Tenneco has spent considerable time and money gathering data on hydrocarbon-bearing formations; this data would provide it a basis for decisions in acquiring leases; and if this data were made public, its competitors would be able to anticipate its conduct regarding acquisition of leasehold rights with a resulting increase in price. Transocean's witness Harrell pointed out that Transocean had uncommitted reserves in offshore Louisiana Blocks 268 and 269, its only uncommitted reserves in the area, and that knowledge of these reserves is of great value to Transocean and would be of great value to its competitors, for it is expected that surrounding blocks will be offered for bids in the future, so that public disclosure of the information would damage its ability to compete. We recognize that disclosure of the reserve information on an area basis as required by the questionnaire may be detrimental to the private interests of some producers, but we agree with the Judge that the potential damage should not override the public interest in disclosure at this time of gas shortage and energy crisis.

<sup>3</sup> *Area Rate Proceeding (Southern Louisiana Area)*, 46 FPC 86, 114 (1971), affirmed *Placid Oil Company v. F.P.C.*, — F.2d — CA5, April 16, 1973), Certiorari granted, — U.S. —, No. 73-437.

19. It is plain from the testimony and arguments that Tenneco, Transocean and Pennzoil are much more concerned that data which the Staff may obtain in an audit will be placed in the public file. Tenneco's witness Leask explained the importance of basic well data and interpretive data derived from it, but said the data required by the questionnaire is not as valuable because it is a total number. Likewise Transocean's witness Harrell said that the reserve audits are not quite as of much value as the log information and test information which might be obtained from audit procedures.

20. In the first place we agree that our order of October 15, 1973, did not address this point. We say here, however, that we have not determined whether to institute a Staff audit, nor what information will be taken from the records of the producers if such an audit is undertaken. We may well determine that the public interest compels disclosure of the uncommitted gas reserves on an area-by-area basis as determined by the Staff audit, maintaining however the confidentiality of geological and geophysical, or other information excepted on a discretionary basis from the mandatory disclosure provision of the Freedom of Information Act (5 U.S.C. § 552) exception (b)(4) and (9). But this is a different problem from that now before us. If we contemplate such a step we will give the producers further opportunity to make their views known on the specific data that may be involved and to be heard.

21. TransOcean further argues that public disclosure of reserve information from TransOcean would clearly be contrary to the policy of the Natural Gas Act expressed in Section 8(b). This section gives the Commission and its agents access to the records of natural gas companies and provides that no member, officer, or employee of the Commission shall divulge any fact or information which may come to his knowledge during the course of his examination of the records of the company "except insofar as he may be directed by the Commission or by a Court." As TransOcean argues, this provision is intended to safeguard information; it does not prevent disclosure, but permits disclosure by action of the Commission.

#### THE FREEDOM OF INFORMATION ACT

22. The Judge points out that the Freedom of Information Act (5 U.S.C. § 552) imposes an obligation upon agencies to make certain types of information available to the public with certain exceptions including in paragraph (b)(4) "trade secrets and commercial or financial information obtained from a person and privileged or confidential" and in paragraph (b)(9) "geological and geophysical information and data, including maps, concerning wells." The Judge properly concludes that these exceptions merely provide that public disclosure is not required. Such exceptions are a privilege of the agency not of one seeking to protect the confidentiality of the information. Compare *LaMorte v. Mansfield*, 438 F.2d 448 (CA2, 1971).

23. Furthermore, we note that the situation here is different than that with which we were confronted when we were required to supply gas reserve data to the Senate Judiciary Committee's Subcommittee on Antitrust and Monopoly in compliance with a subpoena (see our order of June 22, 1973), for there the data had been submitted to the Commission under a promise of confidentiality. As, the House Report said on the exceptions to the Freedom of Information Act "where the Government has obligated itself in good faith not to disclose documents or information which it receives, it should be able to honor such obligations."<sup>4</sup>

#### CONSTITUTIONAL QUESTION

24. The Judge notes that Tenneco contended that any Commission order compelling disclosure would raise a question as to an unconstitutional appropriation of Tenneco's property. The Judge refers to the Natural Gas Act and the Federal Power Act giving the Commission very broad powers to obtain data from the regulated natural gas and electric utility companies in connection with the exercise of its responsibilities under those statutes and observes that there is no provision in either Act which undertakes to tell the Commission whether and to what extent it may disclose information obtained as the result of an investigation. The Judge concluded that the assertion here made of a constitutional question requires a more serious and carefully considered presentation than the allegations made at oral argument.

25. More specifically, Tenneco and TransOcean contend in their exceptions that the Commission has recognized that the reserve data is a valuable property

<sup>4</sup> H.R. No. 1497, 89th Cong., 2d Session, p. 10.

right<sup>5</sup> and that its disclosure will result in an unconstitutional taking of private property in violation of the Fifth Amendment to the Constitution, providing in part that "No person shall . . . be deprived of life, liberty, or property without due process of law; nor shall private property be taken for public use, without just compensation."

26. In our opinion information concerning producer reserves is a valuable property right. However, while it may be more valuable than other detailed and voluminous information that we routinely gather from the public utilities and natural gas companies subject to our jurisdiction, it does not differ in kind. This other information also has cost the utilities time and money to gather and may in many instances serve to inform their competitors. This does not make the provisions of the Natural Gas Act, particularly Sections 8(b) and 10(a) constitutionally invalid. Utility regulation could not proceed in the absence of information on the properties and operations of regulated companies. There is here no more a taking than our requirements that cost data be accounted for in a particular way and reports be filed with the Commission for regulatory use and the benefit of the public. See *F.P.C. v. East Ohio Gas Co.*, 338 U.S. 464, 475 (1950); *Northwestern Co. v. F.P.C.*, 321 U.S. 119, 125 (1944).

#### EFFECT OF AMERADA HESS ORDER

27. On October 15, 1973, the Commission issued a final order in *Amerada Hess Corp., et al.*, — FPC —, Docket No. RI74-15, concluding a show-cause proceeding and providing that natural gas reserves data received in connection with the Natural Gas Reserves Study would be maintained on a confidential basis subject to the formal demands of Congress and that an official of the Federal Trade Commission would be permitted to examine and copy the reserves estimates. The Judge found two distinguishing characteristics between *Amerada Hess* and the present proceeding.

(a) *Amerada Hess* involved data collected under an explicit pledge of confidentiality;

(b) The *Amerada Hess* data was collected on a field-by-field basis, instead of an area basis.

28. We think that these distinctions, particularly the first one, are valid in justifying a different treatment of the data filed here.

29. In its brief on exceptions King states that it is no longer subject to the show-cause order because its jurisdictional sales have fallen below 10,000,000 Mcf annually since 1970. It has filed for a small producer exemption in Docket No. CS73-553. In view of this situation we shall relieve King of its obligation to file a completed questionnaire.

#### *The Commission further finds:*

(1) Pennzoil Company, Pennzoil Producing Company, Tenneco Oil Company and TransOcean Oil Inc. have not filed the questionnaire required by order of August 1, 1973, in Docket No. R-405 and have not shown cause why they should not be compelled to do as required by order of October 15, 1973.

(2) The Commission's public interest need for the uncommitted reserves data called for in its August 1, 1973 order outweighs the potential damage to the private proprietary interests of the respondents.

#### *The Commission orders:*

(A) Respondents Pennzoil Company, Pennzoil Producing Company, Tenneco Oil Company and TransOcean Oil Inc. shall file with the Commission on or before March 1, 1974, the completed questionnaire attached as Appendix B to order of October 15, 1973, in these proceedings.

(B) King Resources Company is relieved of its obligation to file the questionnaire referred to in paragraph (A).

(C) The Initial Decision of the Presiding Judge is affirmed as the decision of the Commission to the extent not inconsistent with this opinion and order.

(D) Exceptions not granted are denied.

By the Commission. Commissioner Moody, whom Commissioner Brooke joins, dissenting filed a separate statement appended hereto.

(SEAL)

KENNETH F. PLUMB, *Secretary.*

<sup>5</sup> Order of Modification to Authorize Compliance with Congressional Subpoena Duces Tecum, — FPC —, Docket No. R-405, issued June 22, 1973.

## RELIABILITY OF ELECTRIC AND GAS SERVICE

Docket No. R-405-A

(Issued February 4, 1974)

MOODY, Commissioner, whom Commissioner BROOKE joins, *dissenting*:

The paradox of this case is that the information demanded by the majority—whom considered company-by-company or in the composite—will tell us nothing of value; yet the same information is of great value to the four companies affected by this order, and the value is lost if we publish it.

## THE ISSUES ARE CLEARLY DRAWN

We deal here with a compelled reporting by four companies of their estimates of the volumes of natural gas which each company had available for sale on December 31, 1972, and on June 30, 1973. The nature of the information to be reported is not in dispute, with all Commissioners agreed that the record admits of only one conclusion—that the information is valuable property.

The majority concludes that public disclosure should be ordered. I disagree, believing that forced publication is unconstitutional and without statutory authority. Were forced publication legal, I would still not require publication of the four-company reserve data in the form prescribed by the majority since there is no public need therefor, and the information so required serves no useful purpose. I will address each issue separately.

I. *The Order Violates Constitutional Rights*

It is unfashionable at this time to insist that gas companies have rights under the Constitution that require recognition; but insist I must, just as I must resist the infringement of those rights in the name of "public benefit".

The Constitutional prohibition is clear:

"No person shall . . . be deprived of life, liberty or property without due process of law; nor shall private property be taken for public use, without just compensation."<sup>1</sup>

All species of property, real and personal, are covered;<sup>2</sup> all persons, whether oil company or private citizen, are protected.<sup>3</sup> Only when the exigencies of a true emergency are clearly present is there room to argue that just compensation must not be paid as a prerequisite for a governmental taking.<sup>4</sup>

The majority has expressly found that "information concerning producer reserves is a valuable property right" (Order, p. 10). No other finding is possible on the evidence presented here, nor would any other finding be compatible with prior holdings of this Commission,<sup>5</sup> prior Congressional determinations,<sup>6</sup> and prior court opinions.<sup>7</sup> Given this finding, it necessarily follows that—regardless of the need for public use—no governmental taking without provision for the payment of just compensation is constitutionally permissible. It is not, as the majority suggests, a question of whether the Natural Gas Act is constitutional; it is a question of whether our actions undertaken in the name of the Act are constitutional.

No solace can be found in the majority's stated basis<sup>8</sup> for violation of the Constitution; they say, in effect, "We have taken private property before, so it is all right for us to do it again" (Order, p. 10). This is the antithesis of reasoning. It ignores the fundamental difference between the publication of cost and operating data which has no extrinsic value, the publication of reserve information which has. More egregiously, it reflects the ultimate governmental arrogance of assuming

<sup>1</sup> U.S. Constitution, Amendment V.

<sup>2</sup> *Cincinnati v. Louisville RR Co.*, 223 U.S. 390; *U.S. v. Burns*, 12 Wall 246, 20 L.Ed. 388.

<sup>3</sup> *Cf., Swanson v. U.S.*, 156 F. 2d 442, cert. denied, 329 U.S. 800.

<sup>4</sup> *North American Co. v. Chicago*, 211 U.S. 306.

<sup>5</sup> In an order of June 22, 1973, in Docket No. R-405, — FPC —, the Commission found, with respect to information on uncommitted gas reserves:

"\* \* \* reserve data constitutes a valuable property right \* \* \*" (p. 3.)

On October 15, 1973, in Docket No. R174-15, *Amerada Hess Corporation, et al.*, — FPC —, the Commission found:

"\* \* \* a natural gas company's reserve data, much like a patent or trade secret, constitutes a valuable and closely guarded asset. \* \* \*" (P. 4.)

<sup>6</sup> See, e.g., Senate Report No. 248, 90th Cong., 1st Session, on Section (b) (9) of the Freedom of Information Act, 5 U.S.C. § 552.

<sup>7</sup> *Abbott v. U.S.*, 239 F. 2d 310 (CA5, 1956); *Hunter v. Shell Oil Co.*, 198 F. 2d 485 (CA5, 1952); *Pratt v. Shell Petroleum Co.*, 100 F. 2d 833 (CA10, 1939).

<sup>8</sup> The majority does not claim, nor could they under our statutory limitations, exercise of the police power over interstate commerce as an answer to the respondent's claim of constitutional privilege.

that *all* prior actions *must* have been proper simply because those actions were, in fact, taken.

Nor is it enough to claim, as the majority does, that *because* there is a public need to take and use private property, a taking without compensation is justified (Order, pp. 9-10). Surely public need exists when roads and public buildings and defense installations must be built, but public need cannot override the obligation to pay just compensation for what is taken. Were it otherwise, the constitutional guarantees would be meaningless.

Seven months ago, a unanimous Federal Power Commission examined the constitutional question of public appropriation of uncommitted gas reserve information. At issue was the same information as here involved, differing only as to date. The Commission then said:

“. . . reserve data constitutes a valuable property right which should not be taken without due process and just compensation.”<sup>9</sup>

In the order setting forth this determination, we made it clear that we—a unanimous Commission—regarded a Congressional taking of private property as an infringement of procedural and substantive rights of due process.<sup>10</sup> Seven months later my colleagues, although affording *procedural* due process, embark upon the same denial of *substantive* due process as we so recently condemned.

Are constitutional rights so vague and insubstantial that they exist, or disappear, according to the whim of this Commission?<sup>11</sup> I think not. The factual predicate for the constitutional claim is laid in this record, just as it was before us on June 22, 1973. Is reserve information “property”? Is publication of that information by the Commission a “taking for public use”? The Commission answers both questions affirmatively, as indeed they must. The unconstitutionality of the majority order is thus self-confessed.

## II. The Order Has No Statutory Basis

Ours is not an agency of unlimited power. Three things, and three things only, have been committed to our jurisdiction: Transportation of natural gas for resale in interstate commerce, sale of natural gas for resale in interstate commerce, and natural gas companies engaging in such transportation or sale.<sup>12</sup> Jurisdiction over natural gas companies does not confer jurisdiction over their affairs other than jurisdictional sales or transportation, for not only is our statute cast in terms of “in interstate commerce” rather than “affecting interstate commerce”, but also because Section 1(b) of the Act expressly states:

“(b) The provisions of this act shall apply to the transportation of natural gas in interstate commerce . . . [and] . . . sale in interstate commerce of natural gas for resale for ultimate public consumption for domestic, commercial, industrial, or any other use, and to natural-gas companies engaged in such transportation or sale, but shall not apply to any other transportation or sale of natural gas or to the local distribution of natural gas or to the facilities used for such distribution or to the production or gathering of natural gas.”

Thus the statute does not authorize the Commission to exercise jurisdiction over natural gas company transactions in leaseholds,<sup>13</sup> or over any sales other than sales for resale in interstate commerce.<sup>14</sup>

“Uncommitted reserves” are, by definition,<sup>15</sup> those reserves which are not yet the subject of interstate sale or transportation. Reserves “available for sale” on December 31, 1972, or on June 30, 1973, may never be sold or transported in interstate commerce. They may be sold intrastate, or they may be consumed in company use as fuel or feedstock. As to “uncommitted reserves”—or reserves “available for sale”—which are the *only* subject matter of the majority’s compulsory reporting, the owner is not yet, and he may never be, a “natural gas company,” for, of course, this status flows from the interstate character of the sale or transportation undertaken.

Put most starkly, if the FPC has the power to compel reporting of uncommitted gas, an asset which is *not* in interstate commerce by way of sale or transportation, it must follow that the Commission has the power to compel “natural gas companies” to report oil reserves, domestic and foreign, intrastate natural gas

<sup>9</sup> Order of June 22, 1973, in Docket No. R-405, entitled Order of Modification to Authorize Compliance with Congressional Subpoena Duces Tecum; — FPC —, at p. 3.

<sup>10</sup> *Id.*, at p. 7.

<sup>11</sup> Attached as Appendix A is a copy of the June 22, 1973, order; a comparison of the majority order here with the June 22 order reflects the arbitrary and capricious nature of the majority’s shifting of position.

<sup>12</sup> *Panhandle Eastern Pipe Line Co. v. Public Service Commission of Indiana*, 332 U.S. 507 (1947).

<sup>13</sup> *F.P.C. v. Panhandle Eastern Pipe Line Co.*, 337 U.S. 498 (1949).

<sup>14</sup> *Panhandle Eastern Pipe Line Co. v. F.P.C.*, 324 U.S. 635 (1945).

<sup>15</sup> See Appendices B-2 through B-7, to Order Updating Nationwide Investigation, issued in this docket on August 1, 1973.



reserves and sales, coal reserves, and gasoline and fuel oil reserves. It would thus be true that the debate now joined on broadened oil and gas reporting is unnecessary, for the Natural Gas Act has already bestowed full powers on the FPC.

I do not believe that Congress extended our regulatory reach beyond the jurisdictional grant of Section 1(b) of the Act. I believe that our powers to regulate (which includes the power to require compulsory reports) must be founded in either transportation or sale for resale in interstate commerce. Since "uncommitted reserves" are *not* in interstate commerce, they are as far removed from our jurisdiction as the leases which contain those reserves.<sup>16</sup> Clearly the existence of, and the magnitude of, and the availability of, uncommitted reserves may affect interstate commerce. But the difference between gas transactions "in" interstate commerce, and gas transactions "affecting" interstate commerce, is precisely the difference between what Congress entrusted to us, and what Congress withheld from us.

The notion that our basic jurisdictional grant must be read into every section of the Natural Gas Act is not original. Recently, we have been reminded that the Act contains certain "core" sections<sup>17</sup> which define our substantive regulatory functions, and certain "necessary and appropriate" sections<sup>18</sup> which outline permissible procedures for use in performing the substantive regulatory functions. We have been told unequivocally that the "necessary and appropriate" sections are not independent grants of power, and cannot be used to enlarge the "core" section regulatory functions. *Mobil Oil Corporation v. F.P.C.*, \_\_\_ F.2d \_\_\_ (CADC, No. 72-1471, slip opinion issued July 11, 1973). The Court there held—and we did not seek Supreme Court review—that:

" . . . Section 16, which uses a broad generality of 'necessary and appropriate' that is not rooted in a (substantive regulatory) function, cannot enlarge the choice of permissible procedures beyond those that may fairly be implied from the substantive sections and the functions there defined." (Slip opinion at pp. 36-37; parenthesis added.)

This view is in accord with *F.P.C. v. Panhandle Eastern Pipe Line Co.*, *supra*, at pp. 505-506; *New England Power Company v. F.P.C.*, \_\_\_ F.2d \_\_\_ (CADC, No. 71-1539, slip opinion issued August 15, 1972, cert. granted 41 U.S.L.W. 3608); and *Niagara Mohawk Power Company v. F.P.C.*, 329 F.2d 153 (CADC, 1967). This same reading of the Act was reiterated only last week. See *American Smelting & Refining Company, et al. v. F.P.C.*, \_\_\_ F.2d \_\_\_ (CADC, No. 72-2204, slip opinion issued January 21, 1974) at pp. 16-17.

The majority makes the fatal legal error of asserting its right to require compulsory reporting under authority of Sections 8, 10, 14 and 16 of the Act (Order, p. 3) without invoking any of the "core" sections of the Act. On January 21, 1974, we were again reminded by the Court of Appeals that:

" . . . As we have stated before, of course, section 16 does not itself grant independent powers but merely provides for implementation of the core sections of the Natural Gas Act. . . ." (*American Smelting & Refining Co., et al. v. F.P.C.*, *supra*, at p. 17.)

Today marks the fourth time that the Commission has attempted to use one or more of the "necessary or appropriate" procedural sections of the Act as a substantive basis for regulatory action. The first three times resulted in judicial reversal. *New England Power Co. v. F.P.C.*, *supra*; *Texaco Inc. v. F.P.C.*, \_\_\_ F.2d \_\_\_ (CADC, No. 71-1560, slip opinion issued December 12, 1972), cert. granted 42 U.S.L.W. 3194; and *Mobil Oil Corporation v. F.P.C.*, *supra*. Unless and until the majority can demonstrate substantive jurisdiction to do that which they propose, they are not legally privileged to rely upon procedural sections of the Act.

In *F.P.C. v. Panhandle Eastern Pipe Line Co.*, *supra*, the Supreme Court intimated, but did not decide, that Section 14 might convey broader powers than the other "necessary or appropriate" sections of the Act. See 337 U.S. at 505-506.

It would be logical, of course, for Section 14 to have a broader reach than the the Commission's stated jurisdiction since Section 14 deals with investigations which the Commission might undertake as a basis for recommending legislation to Congress. If Congress had intended this logical result, however, it would have been necessary for Congress to word Section 14 in the same fashion as Congress worded Section 311 of the Federal Power Act. Section 311, otherwise substantially the same as Section 14(b) of the Natural Gas Act, contains an express

<sup>16</sup> *F.P.C. v. Panhandle Eastern Pipe Line Co.*, *supra*.

<sup>17</sup> Such sections as Sections 4, 5 and 7.

<sup>18</sup> Such sections as Sections 8, 9, 10, 14 and 16.

authorization for the Commission to investigate and secure information with respect to matters "whether or not otherwise subject to the jurisdiction of the Commission."

It is significant that this Commission has historically recognized the fundamental difference between our investigatory powers under Section 14(b) of the Natural Gas Act and Section 311 of the Federal Power Act, and has, for years, sought legislative change to grant broadened authority in the natural gas field. For example, in the Commission's 1959 Report to Congress, the Commission, then under the chairmanship of the Honorable Jerome Kuykendall, recommended:

"*Natural Gas Act—comprehensive investigatory authority.*—That section 14(a) of the Natural Gas Act be amended so as to give to the Commission broad investigatory powers with respect to the gas industry similar to those now conferred on it with respect to the electric industry by section 311 of the Federal Power Act." (p. 21; footnote omitted.)

Similarly, in the Commission's 1962 Report to Congress, the Commission, then under the chairmanship of the Honorable Joseph C. Swidler, recommended:

"*Broadened informational authority.*—Amend section 14(a) so as to give the Commission broad powers to conduct investigations and collect information with respect to the natural gas industry similar to those now conferred on it with respect to the electric industry by section 311 of the Federal Power Act.

This would fill a serious void in the Commission's effectiveness for, in the absence of authority such as is presently provided for the electric power industry by the provisions of section 311 of the Federal Power Act, the existing statistical information on the industry as a whole is inadequate to meet the needs for detailed industry information of value to the Commission, Congress, other Government agencies, and the general public. As in the case of the analogous section of the Federal Power Act, the proposal makes clear that the new informational activities would not subject to the Commission's jurisdiction any persons not already subject thereto . . ." (p. 13.)

So also, in the Commission's 1966 Annual Report to Congress, the Commission, then under the chairmanship of the Honorable Lee C. White, recommended:

"*Broadened Informational Responsibility Under the Natural Gas Act.*

The Commission recommends the amendment of the Natural Gas Act to enable the Commission to gather, publish and disseminate appropriate information about the entire natural gas industry for the benefit of consumers, interested State and Federal agencies and the industry itself. The natural gas industry has grown into one of the major industries of the Nation, supplying one-third of our national energy requirements. Consequently the need for detailed and continuing information concerning this basic resource has become equally compelling with the need for electric energy information, . . . which the Commission now supplies under the authority of Section 311 of the Federal Power Act. . . ." (p. 9.)

Finally, in its 1972 Report to Congress, the Commission, under the chairmanship of the Honorable John N. Nassikas, proposed:

" . . . , the Commission has in prior sessions of Congress proposed the adoption of a bill . . . which would enlarge the Commission's authority under the Natural Gas Act to collect, publish and disseminate information with respect to the natural gas industry comparable to that which it already possesses regarding the electric utility industry under the Federal Power Act. The Commission considers that such added authority would enable it to act more effectively on the basis of more complete information with a view to meeting the serious gas supply problems with which the United States is now confronted and which will exist for an indefinite period in the future." (p. 8)

I choose the foregoing as illustrative, since it appears that the Commission has made the same legislative recommendation in every annual report to Congress for at least the past 20 years.

My colleagues' impatience with Congressional failure to respond to a recommendation of such longstanding is understandable; their effort to rewrite the law and thereby obviate the need for Congressional action is not.

For the majority order to stand, a reasonable relationship between the reporting required and substantive jurisdiction (as to rates under Sections 4 and 5, or

as to certification under Section 7) must be shown.<sup>19</sup> Such a relationship has not been demonstrated, and, under this record cannot be demonstrated.

### III. *The Data to be Collected Serves No Regulatory Need*

The Commission's first investigation of uncommitted reserves, carried out by investigating officers on a confidential basis, occurred after the issuance of a Notice in 1970.<sup>20</sup> The second, also on a confidential basis, followed a 1972 Order<sup>21</sup> updating the 1970 investigation. Following each investigation, Staff prepared, and placed in the public files, a composite of the information received.

In the two years and two months I have been a member of this Commission, the uncommitted reserve data has not provided a stated basis for any decision of this Commission.<sup>22</sup> No order or opinion, issued by this Commission since I have been here, has utilized the uncommitted reserve data which we already have, either as an analytical tool or as a reason to take, or not take, action. Under these circumstances, I find the majority's claim of a compelling need somewhat hollow.

The regulatory need hypothesized by the majority is set forth at pp. 5-8 of the Order. It is said:

"To conclude, in resolving the national energy problem the reserve information is needed by *all* agencies of government, *Federal and State* that are concerned with this problem so as to permit *them* to determine the extent of available reserves to meet demand, . . . ." (Order, p. 7; emphasis supplied.)

I can conceive of no clearer recognition that we are acting outside, and far beyond of Section 1(b) powers, than this claim of need. It simply cannot be related to the limited powers given the Commission by Congress.

The majority asserts also that this report is needed (1) to assist the Commission in "assessing the nation's gas supply situation" (Order, p. 6), (2) to assess "the extent of the current shortage problem" (Order, p. 6), (3) to help determine if the shortage is short-term (Order, p. 6), and (4) to measure the success of various Commission policies (Order, p. 6).

These assertions of need, though valid enough in the abstract,<sup>23</sup> do not relate to any substantive regulatory function given the Commission by the Natural Gas Act. Is the reported information necessary or appropriate to the performance of rate or certificate functions? How will the reported information be used in connection with rate or certificate issues? Unless and until the majority can articulate a regulatory need based on the performance of our statutory duties—as opposed to a statement of generalized curiosity about nonjurisdictional matters—the illegality of their order is apparent on the face of the order.

### IV. *The Reports Will Not Accomplish The Result Desired.*

As noted, the majority has undertaken a generalized statement of why they feel a need to compel disclosure of proprietary information. Let us assume, *arguendo*, that a lawful statutory purpose is set forth. Will the specific reports required by the majority fulfill this statutory purpose? I think not.

The more obvious deficiencies in the report endorsed by the majority are:

(1) The reporting is required of only 80 gas producers;<sup>24</sup> uncommitted reserves

<sup>19</sup> For example, the Supreme Court has recognized that the Commission cannot regulate interstate sales for resale by a natural gas company which also makes nonjurisdictional sales, without information necessary to make cost allocations. *Colorado Interstate v. F.P.C.*, 324 U.S. 581 (1945). Compulsory reporting for this purpose within the contemplation of Section 5(b) of the Act which states:

"(b) The commission upon its own motion, or upon the request of any State commission, whenever it can do so without prejudice to the efficient and proper conduct of its affairs, may investigate and determine the cost of the production or transportation of natural gas by a natural-gas company in cases where the Commission has no authority to establish a rate governing the transportation or sale of such natural gas."

With the exception of reporting required for cost allocation in *jurisdictional rate regulation*, neither the statute nor any court decision empowers the Commission to move beyond the limits of the "core" sections of the Act to assert powers of regulation (which compulsory reporting surely is) over the nonjurisdictional affairs of natural gas companies.

<sup>20</sup> Policy Statement and Notice of Investigation, issued November 4, 1970, Docket No. R-405, \_\_\_ FPC

<sup>21</sup> Order Updating Nationwide Investigation, issued September 12, 1972, Docket No. R-405, \_\_\_ FPC

<sup>22</sup> Not fully trusting my own powers of recollection, I have urged the majority to refresh my memory by citation of any order or opinion wherein the uncommitted reserve data was utilized. They have furnished none.

<sup>23</sup> The majority wholly fails to relate their assertions of regulatory necessity to a taking of property from the four specific companies which resist this order. The failure is not the result of oversight, but reflects instead a tacit recognition that the evidence in this record conclusively establishes an *absence* of need for data from the four companies whose rights are involved. See Tr. 305-310; Tr. 1/28, 29, 31.

<sup>24</sup> See Order Updating Nationwide Investigation, issued August 1, 1973, in this Docket No. R-405-A, and Appendix A-1 attached thereto.

held by the thousands of other producers, and by the pipeline companies, will never be reported.

(2) The report calls for "proved reserves", which are further defined as:

"The current estimated quantity of natural gas which analysis of geologic and engineering data demonstrate with reasonable certainty to be recoverable in the future from known oil and gas reservoirs under existing economic and operating conditions."<sup>25</sup>

What are "existing economic conditions?" Are they judged by the Commission's area ceiling rates of 21.5¢-35¢/Mcf? Or are they judged by intrastate rates of 70¢-100¢/Mcf? Are they judged by today's costs, or by projection of tomorrow's anticipated costs? The volume of gas recoverable from any reservoir is always a function of economics; as sales price and/or costs go up or down, the economic limits of production will occur sooner, or later. Unless all reporting companies use the same set of economic assumptions, which assumptions are clearly defined and stated in advance of reporting, the reports are unreliable.

(3) The report calls for volumes of gas "available for sale" on December 31, 1972, and June 30, 1973.<sup>26</sup> Each reporting company is free to *not* report gas "reserved" for direct industrial contracts (whatever that means), and may omit reporting gas held for "company use-fuel and feedstock" (whatever that means). Under these parameters, any reporting company must make subjective judgments as to what volumes are reportable as "available for sale" and what volumes are not reportable.<sup>27</sup>

Were I persuaded that we had constitutional and statutory authority to require publication of uncommitted reserves information, I still could not agree to an order which perpetuates a deficient reporting system. The deficiencies—which the majority fail to address even inferentially—have been brought to our attention on two public records. In hearings before the Senate Subcommittee on Antitrust and Monopoly of the Committee on the Judiciary held October 16-18, 1973, serious charges were made that the form of reporting now adopted by the majority permits misleading and unreliable reporting.<sup>28</sup> The same assertions are contained in the Office of Economics' Offer of Proof included in this record. I think the majority does itself, and the cause it is attempting to serve, a grave disservice by not addressing these issues. When, and if, the majority's order is effectuated, surely the majority must realize that the Commission will be confronted with the charge that the required reporting is incomplete and unreliable.

If we are aware, in advance, of an attack on the credibility of information not yet gathered, we are somewhat less than perceptive when we wholly ignore the attack and refuse to address the questions that have been raised.

#### V. *The Order Is Contrary to the Public Interest*

I have a grudging admiration for my colleagues' ability to play with words. We are told (Order, pp. 2-4) that this proceeding invokes "public interest" vs. "private interest", and that, when weighed in our impartial scales, "public interest" must win out.

Fair enough. But what happened to the "public interest" we found conclusive seven months ago in this same docket? We then and there found that publication of uncommitted reserve data offended the *public* interest by (1) inhibiting future exploration, (2) producing anticompetitive effects, and (3) violating constitutional guarantees against the taking of property without payment of just compensation.<sup>29</sup> What was of public interest seven months ago has apparently evaporated,

<sup>25</sup> See Appendices B-2 and B-8 to the August 1, 1973, Order, *supra*.

<sup>26</sup> See Appendices B-2 through B-7 to the August 1, 1973, Order, *supra*.

<sup>27</sup> It is true, of course, that these deficiencies existed in the 1970 and 1972 reporting. One consequence thereof is that now the companies which responded to our earlier nondefinitive data requests are under threat of criminal investigation. On October 18, 1973, at the conclusion of hearings held before the Senate Subcommittee on Antitrust and Monopoly of the Committee on the Judiciary, Senator Edward M. Kennedy stated:

"And finally, I will ask the Department of Justice to examine the analysis provided of the R-405 updates to determine whether violation of the Federal criminal law prohibiting false statements to the government may have occurred." (Tr. 358.)

I intend to be no part of a system which prescribes a report form calling for judgments based on unstated "economic conditions" and undefined gas availability, knowing as I now do, that judgmental reporting is, in the opinion of some, a basis for criminal law sanctions.

<sup>28</sup> As an aside, the October hearings provide an intriguing glimpse into the Byzantine ways of the bureaucratic substructure. At the hearings, two members of the Commission's Office of Economics attacked the R-405 reporting procedures: Mr. Wilson used such terms as "useless", "grossly inadequate", and "semantic juggling" to describe the R-405 reporting. Mr. Wald opined that the information obtained was "not reliable". Oddly enough, the Office of Economics did not offer such views to the Commission prior to the issuance of the R-405 notices which prescribed the form of reporting.

<sup>29</sup> See Order of June 22, 1973, *supra*, footnote 9.

for the majority order does not even mention these considerations. Is there any less public interest today in fair competition than there was seven months ago? Is there any less need to avoid inhibition of exploration? Is the Constitution less important today? I can find no basis for so concluding, nor I suspect, can the majority.

Three months ago, we again found that the public interest required *non*publication of reserve data. On October 15, 1973, we said:<sup>30</sup>

"To begin with, it must be recognized that a natural gas company's reserve data, much like a patent or trade secret, constitutes a valuable and closely guarded asset. *Making this asset available to competitors, without due compensation, would most certainly be inimical to competition, . . .*" (Order, p. 4, emphasis supplied).

"In addition to the competitive problems, *the general disclosure of proprietary reserves data would have an inhibiting effect on future exploration of natural gas reserves . . . [and] would only exacerbate the critical gas supply shortage.*" (Order, p. 6, emphasis supplied.)

It is nothing less than arbitrary and capricious for this Commission to issue today's order without acknowledging the existence of public interest considerations inherent in nondisclosure. It is unlawful to ignore this record, which conclusively shows that the public interest will be damaged by public disclosure of reserve data.

The majority's reporting requirement is incompatible with the public interest in yet another regard. The reserve information obtained thereby is susceptible to misinterpretation and misuse; it will, in fact, mislead.

I do not speak rhetorically, nor speculatively, in so asserting. This record contains the following:

"Q. Specifically, how will the requested data help in the determination of the ability of gas producers to meet the total demand for gas and of the expected extent of the companies' responsiveness to alternative price options?

A. There are three ways in which the requested data can help to answer these fundamental questions. First, the information shows the bare minimum amount of gas supply which is readily available for sale. Second, the data is useful in the determination of the holding or carrying cost to the producers of uncommitted reserves. And third, the information as requested permits the development of concentration ratios for available unsold gas supplies." (Tr. 65-68).

This testimony was offered by Staff Economist Rodney Stevenson, and has now been adopted by the majority (Order, p. 5).

The error in this analysis is evident when we recall the exact nature and extent of the reporting mandated by the majority in this order. It is inescapable that when, and if, the reporting is complete we will *not* have

"the bare minimum amount of gas supply which is readily available for sale." To the contrary, we will know the volumes of "proved reserves"<sup>31</sup> which were "available for sale"<sup>32</sup> on December 31, 1972, and on June 30, 1973, as reported by eighty out of several thousand natural gas producers.

If our own Office of Economics fails to understand that this reporting system does *not* include *all* uncommitted reserves, and that the report will speak only to volumes available on a specific day six months ago, I am quite sure that others, presumably less expert, will misconstrue the data which we collect.

It is equally clear that when, and if, the reporting is complete we will *not* have a basis for "determination of the holding or carrying cost to the producers of committed reserves". Carrying costs could be ascertained *only if* the report required data, as to each increment of available volumes, concerning date of lease acquisition, cost of lease acquisition, date drilling costs were incurred, amount of drilling costs, whether debt or equity funds were used for lease acquisition and capital expenditures and if debt, the cost thereof.

It is also clear that when, and if, the reporting is complete, we will not have information which "permits the development of concentration ratios for available unsold gas supplies". To the contrary, the only concentration ratios

<sup>30</sup> Order, October 15, 1973, in R174-15, *supra*, footnote 5.

<sup>31</sup> I have previously noted the uncertainties inherent in a definitional base which is dependent upon unstated "economic conditions"; see p. 14, *supra*.

<sup>32</sup> So also, the judgmental factor involved in determining what is "available for sale" under our imprecise instructions is a valid cause for concern; see p. 15, *supra*.

that can be developed will be with respect to the volumes reported by the reporting companies—not with respect to *all* reserves by whomsoever held. And, of course, any concentration ratios will reflect concentration only on a one-day basis.

I can predict with complete certainty that the reserves reported under the majority order will become the subject of concentration ratio studies. This was done with respect to our last investigation of available reserves and then offered to the Congress as proof of a noncompetitive market structure.<sup>33</sup>

A concentration study based on R-405 data is a travesty of objective market analysis. *Because* the only firms reporting are large producers, and *because* the report covers only single day figures, and *because* the reporting is made by subjective judgment of economic conditions, the data obtained hereunder will not permit a valid study of concentration in the industry.

Would an objective economist offer opinions on concentration in the baking industry based on data responses from only the largest bakers, which reflected stock on hand at the close of business on one day a year? Might not it occur to him that baking is a continuous process, with new bread baked and new bread sold day-by-day, so that unsold inventory on any given day reflects nothing about market shares? And if concentration studies are made to analyze whether market control exists, is not data from *all* bakers, large and small, essential to a determination of concentration?

I can find little difference between the analogy I pose and the validity of concentration studies based on partial reporting of single-day supply availability. Gas exploration, production, and sales are continuing activities; the volumes available for sale on June 30, 1973, will not be the same as the volumes available on July 30, 1973, if a sale has been made, or if a new discovery has been made. Accordingly, an analysis of concentration on any one day says nothing about concentration generally. Nor can concentration of control over new supplies be measured unless *all* new supplies are covered in the data under study.

The fallacy of a competition analysis based on R-405 data should be obvious to anyone marking the limits of the data under study; unfortunately, however, the prior invalid studies made of previous R-405 data have apparently been accepted by some. For example, on October 1, 1973, when Senator A. E. Stevenson III introduced S. 2506, which legislation would drastically alter the industry's structure, he commented upon the concentration of ownership of "uncommitted gas reserves". Congressional Record, Vol. 119, No. 145, at S-18141-18142. Thus the distortion to which our previous R-405 data has been subjected misinforms and misleads even the Congress of the United States. We should not persist in the Collection of incomplete and uncertain information which is subject to misuse and distortion.

#### CONCLUSION

I, no less than my colleagues, recognize the absence of a comprehensive system of reporting on the nation's energy resource base. Where we differ is that they think *some* information is better than no information, while I am unwilling to take unconstitutional, unlawful, unsound action that will result in a data collection which misleads rather than informs.

The problem presented by the need for comprehensive data is a problem for Congress; the majority's attempt to step beyond the law creates a problem for the courts.

RUSH MOODY, Jr., *Commissioner*.

<sup>33</sup> See e.g., the testimony of David S. Schwartz, FPC, Office of Economics, at hearings before the Special Subcommittee on Integrated Oil Operations, Committee on Interior and Insular Affairs, of the United States Senate, on December 13, 1973; at pp. 13-14 of his prepared testimony. Mr. Schwartz argued:

"Another valid concentration measure for 'new' gas supplies is reflected in Table 3 indicating the uncommitted reserves of producers as reported to the Commission. On December 31, 1971, the eight largest firms in all the major producing areas controlled between 83.3% of the available reserves in the offshore Federal domain of Southern Louisiana and as high as 100% of uncommitted reserves in the offshore State reserves in Southern Louisiana. For the later period, June 30, 1972, the 8-firm concentration in the major producing areas ranged from a low of 75% in the Federal domain of offshore Southern Louisiana to a high of 100% in the offshore domain of Southern Louisiana."

## APPENDIX A

## UNITED STATES OF AMERICA, FEDERAL POWER COMMISSION

Before Commissioners: JOHN N. NASSIKAS, Chairman; ALBERT B. BROOKE, Jr.,  
and RUSK MOODY, Jr.

Docket No. R-405

## RELIABILITY OF ELECTRIC AND GAS SERVICE

ORDER TO MODIFICATION TO AUTHORIZE COMPLIANCE WITH CONGRESSIONAL  
SUBPOENA DUCES TECUM

(Issued June 22, 1973)

This Commission is called upon today to determine whether its Chairman should supply confidential gas reserve data to the Senate Judiciary Committee's Subcommittee on Antitrust and Monopoly on June 26, 1973, in compliance with a subpoena *duces tecum*, notwithstanding that such action is inconsistent with the terms and spirit of earlier orders of this Commission eliciting such data. For the reasons discussed hereafter, we find that compliance with the subpoena is our only alternative in the absence of judicial intercession.

In 1970, in response to the increasingly pessimistic reports of the nation's natural gas reserves, this Commission launched an investigation into the present and future adequacy of the interstate gas supply. In furtherance of said investigation, on November 4, 1970, we issued in Docket No. R-405 a document entitled "Policy Statement, Notice of Investigation, and Proposed Rulemaking With Respect to Developing Emergency Plans." This order required all large scale producers of natural gas to report any holdings of proven natural gas reserves in any area which had not been contracted to pipeline companies for resale or to direct customers for immediate consumption. In seeking to elicit this data, the Commission assured the producers that, although the information would be received on a company-by-company basis, only composite figures for the industry would be released to the public and that the material received would be treated in a confidential manner. This assurance was specifically stated in the Commission's order of November 4, 1970:

Information revealed to the Staff shall be treated as confidential information without public disclosure under the provisions of Section 8(b) of the Natural Gas Act [15 U.S.C. 717g] and the Freedom of Information Act [5 U.S.C. 552(b)(4)]. Compliance with the order shall not constitute nor be construed as a waiver of any claim of privilege by any producer.

Further information was requested on September 12, 1972, when the Commission issued its "Order Updating Nationwide Investigation." The Commission again assured the producers that the confidentiality of the data submitted would be respected:

For the purposes of this investigation no responses submitted in compliance herewith shall be made available for inspection or copying by the public; individual company information received as a result of this continued investigation will be maintained in confidential status in accordance with the provisions of Section 8(b) of the Natural Gas Act, 15 U.S.C. 717g(b), and the Freedom of Information Act, 5 U.S.C. 552(b)(4) and (9).

The policy reasons underlying our assurance of confidentiality are obvious. In a period when the gas supply shortage is most acute, disclosure of detailed reserve data would undoubtedly inhibit future exploration for new gas reserves since speculators and competitors could equally benefit from the geological and geophysical expenditures of other companies. A competitor would particularly benefit from knowledge of another producer's uncommitted reserves for particular locations, especially in highly competitive areas. In addition, it would be extremely unfair to sellers of gas to disclose such data to potential buyers with whom they

negotiate for the sale of gas. Furthermore, we believe that certain reserve data constitutes a valuable property right which should not be taken without due process and just compensation.

On the basis of our assurance of confidential treatment, seventy nine producers voluntarily furnished the Commission with the detailed uncommitted reserve data as of December 31, 1971, and June 30, 1972, requested in the order of September 12, 1972. This group represented all of the producers who had individual sales of natural gas subject to the jurisdiction of the Commission of over 10 million Mcf annually.

On March 7, 1973, Senator Philip A. Hart, Chairman of the Senate Judiciary Committee's Subcommittee on Antitrust and Monopoly, requested by letter that the Commission provide certain information to his subcommittee and to the Federal Trade Commission as to the manner in which the gas supply data was gathered and analyzed. Specifically, Senator Hart requested that the Commission provide:

1. The questionnaire or other request for information sent to the 79 producers.
2. A description of the procedure used to verify the data supplied by the producers.
3. An estimate of the proportion of domestic natural gas reserves available for sale controlled by the 79 producers.
4. The amount and possible reason for each of the 79 producers' decline in reserves.
5. The identity of each producer's pipeline customers and the amounts of gas sold to each and the price obtained for the 1970 to mid 1971 period.

By letter of March 20, 1973, from Thomas J. Joyce, Chief of the Commission's Bureau of Natural Gas, Senator Hart was supplied with the requested information, except the detailed data on specific reserves held by individual producers. As to this latter information, Senator Hart was advised that it was confidential in its disaggregated form in accordance with the provisions of Section 8(b) of the Natural Gas Act, 15 U.S.C. 71 g(b), and the Freedom of Information Act, 5 U.S.C. 552(b)(4) and (a).

On May 18, 1973, Senator Hart requested by letter that Chairman Nassikas appear before the Subcommittee on Antitrust and Monopoly and offer testimony on competition and concentration in the natural gas industry. In addition to requesting that Chairman Nassikas direct his comments to the general impact of government regulation on competition within the industry and the effectiveness of such regulation in increasing natural gas production, Senator Hart renewed his request for detailed information given by producers to the Commission showing the concentration of control of certain reserves and the amounts controlled by the major producers.<sup>1</sup>

On June 18, 1973, Chairman Nassikas responded to Senator Hart's requests by indicating in a letter that the members of the Federal Power Commission would testify before his Subcommittee on the indicated date, *i.e.* June 26, 1973. The Commission also stated that it sought to comply with the request for the producer data as fully as possible without violating the conditions of confidentiality by which the data had been obtained. In this regard, the Commission submitted composited data, prepared especially for the Subcommittee, identifying the ratio of gas reserves controlled by the top four, eight, and twenty producers in each production area of the nation.<sup>2</sup> The Commission emphasized that if the information so supplied was further broken down to reveal the exact amount of reserves held by each production company and the exact geographical location of such reserves, and such data was made public, adverse competitive effects and inhibition of exploration efforts might result, as well as a violation of the September 12 order. It was further emphasized that such producers would then be extremely reluctant to divulge such information to the Commission in the future, thus hampering the Commission's regulatory function.<sup>3</sup>

On June 21, 1973, Chairman Philip A. Hart, acting on behalf of the full Subcommittee, issued a *subpoena duces tecum* directing that Chairman Nassikas appear before the Subcommittee on June 26, 1973, and bring with him at that time all of the following material:

<sup>1</sup> Senator Hart, while indicating the scope of his inquiry, has never identified the legislative purposes of his subcommittee's involvement in requesting the detailed individual producer data, nor the nature and extent of its authority to request such data. *Watkins v. U.S.*, 351 U.S. 178 (1957), *Gojack v. U.S.*, 384 U.S. 702 (1966); Sections 134(a) and 136 of the Legislative Reorganization Act of 1946, 2 U.S.C. 1901 and 1903, and 41 Op. Attny. General 221, 225-229 (1955).

<sup>2</sup> Senator Hart has never indicated why the Chairman's June 18 response did not fulfill the legislative purposes of the Subcommittee's inquiry.

<sup>3</sup> Cf. *Electric Bond & Share Co. v. S.E.C.*, 303 U.S. 419 (1938); *Rovario v. U.S.*, 353 U.S. 53 (1957).



1. All memoranda, documents, and writings of any nature whatsoever in the possession, custody, or control of the Federal Power Commission or any member or employee thereof referring or relating to FPC Order updating nationwide investigation in Docket No. R-405 dated September 12, 1972.

2. All workpapers and composites resulting from material received in connection with reissued Docket No. R-405 dated September 12, 1972.

Since the inception of the Subcommittee's investigation, we have voluntarily complied with all requests for data to the extent permitted by our orders, rules, regulations and the provisions of the Natural Gas Act. Moreover, pursuant to the Subcommittee's request, we have made our staff members available for private interrogation by the Subcommittee's staff. The only information which has been withheld is the individual reserve data filed by producers or recorded on worksheets by staff which we have regarded as protected under the provisions of our order, the Natural Gas Act, and the Freedom of Information Act. However, as reflected by the *subpoena duces tecum*, it appears that our assertion of privilege has been summarily rejected by the Subcommittee.

We recognize that this Commission is an arm of Congress and should be responsive to legitimate legislative inquiries as to matters within the ambit of our responsibility. We conclude, therefore, that it would be inappropriate for this Commission to place its Chairman in jeopardy of contempt of Congress by refusing to disclose that which is protected by our order of September 12, 1972.

We therefore modify our order of September 12, 1972, so as to authorize the Chairman to respond to the *subpoena duces tecum* served upon him on June 21, 1973, and under compulsion of congressional process, we direct the delivery to the Senate Committee on the Judiciary's Subcommittee on Antitrust and Monopoly of the data and information collected under our order of September 12, 1972, such delivery to the Subcommittee, however, being made expressly under protest and subject to the requirements of confidentiality and protection against public disclosure as set forth in our said order of September 12, 1972, unless otherwise waived by filing producers by notification to the Subcommittee.<sup>4</sup> Accordingly, we authorize the delivery of the data demanded by subpoena to the Subcommittee to be held, used, or published by the Subcommittee and its staff, subject to the responsibilities of nondisclosure which are imposed by Congress in the applicable provisions of the Natural Gas Act and the Freedom of Information Act.

In so modifying our order of September 12, we would emphasize the harm and injury which may result if the confidential information demanded by the Subcommittee is released to the public. While the passage of time since the last reporting date of June 30, 1972, may have altered the competitive sensitivity of the R-405 data, we cannot so assume in the absence of evidence. Accordingly, we give express notice to the Subcommittee that public disclosure may well produce anticompetitive effects in the natural gas industry and may result in the taking of property without provision for the payment of just compensation.

In issuing this order, we further recognize that the procedural and substantive due process rights of citizens of the United States are placed in jeopardy. The time constraint imposed by the Subcommittee precludes any meaningful notice to those whose property rights are being affected, and any real opportunity on their part to be heard prior to entry of this order and prior to the disclosure now demanded by the Subcommittee.<sup>5</sup>

It is equally clear that public disclosure on June 26, will result, in the absence of waiver by filing producers, in immediate and irreparable injury to those who have filed confidential information with us in that, by reason of public disclosure, the proprietary value of the information will be destroyed.

This order is final and effective upon issuance. In the absence of restraint by a court of competent jurisdiction, the Subcommittee's subpoena will be honored on June 26, 1973, at 10:00 o'clock, A.M., Eastern Daylight Time.

The Secretary is directed to give immediate telegraphic and telephonic notice of this order to the Subcommittee and to all respondents.

*The Commission finds:*

Our order of September 12, 1972, in this docket is hereby modified as provided above.

By the Commission. Commissioners MOODY and BROOKE concurring, filed a separate statement appended hereto.

(SEAL)

KENNETH F. PLUMB,  
Secretary.

<sup>4</sup> *Supra*, p. 2.

<sup>5</sup> *Cf. Accardi v. Shaughnessy*, 347 U.S. 260 (1954); *Service v. Dulles*, 354 U.S. 363 (1957).

## RELIABILITY OF ELECTRIC AND GAS SERVICE

Docket No. R-405

(Issued June 22, 1973)

MOODY and BROOKE, Commissioners, Concurring:

Today's order, without notice or opportunity for hearing, abridges the constitutional rights of United States citizens, and property entrusted to us will be taken, without compensation, on Tuesday of next week. Because of the time constraints imposed by the Subcommittee, those who stand aggrieved by our order are denied their rights of rehearing and judicial review of this order.

We concur in the issuance of this order only because the alternative to issuance is to place the Chairman of this Commission in jeopardy. If we adhere to the terms of our September 12, 1973, order, Chairman Nassikas cannot obey the Subcommittee's subpoena without violating that order, and thereby rendering himself liable to prosecution under Section 21 of the Natural Gas Act. Nor can he disobey the subpoena without liability for contumacious conduct. We cannot, in good conscience, suffer this result to be visited upon a dedicated public servant who has sought only to serve the public interest, and who has done so with honor and distinction.

This Agency is being compelled, by subpoena, to make public that which was filed with us under a promise of confidentiality. The promise was ours, as delegates of the Congress, to make under the Freedom of Information Act<sup>1</sup> and the Natural Gas Act.<sup>2</sup> What Congress granted to this Commission should not, in our judgment, be abrogated by a Subcommittee. The information given is property, recognized by the Courts as inherently valuable. Its value lies in confidentiality, and it is entitled to protection from unauthorized disclosure.<sup>3</sup>

The issue here is not whether certain information should or should not pass into the public realm, because, for all we know, the R-405 data may no longer be deserving of protection. The issue is one of procedural and substantive due process. Are not the owners of the property here involved entitled to notice and an opportunity for hearing before their rights are affected? And are not those threatened with summary deprivation of their property entitled to establish their right to just compensation? Whatever the legislative needs of the Subcommittee, those needs should not be served in such a manner that due process is ignored.

In a larger sense, the issue here is whether the government can be trusted by its citizens. Our order of September 12, 1972, set up the ground rules for our data collection. If we were in error in exercising our discretion to obtain information on a confidential basis, that error could have been, and should have been, corrected on judicial review of the September 12 order itself. No error was asserted. Citizens relied upon our order. The Subcommittee now demands, by its subpoena, that the rules of the game be changed.<sup>4</sup> We would conclude, therefore, that any citizen who relies upon his government to respect a promise of confidentiality should be forewarned that the promise of privacy may be unenforceable. Tax returns and census information are received from private citizens under a promise of confidentiality; do we now understand that privacy here is not what the citizenry has been told?

The issues raised by the Subcommittee's subpoena are peculiarly suited to resolution by the judiciary. There an appropriate balancing of public and private interest can be made without prejudicing the right of any concerned party, with due regard for the constitutional doctrine of separation of powers, and with proper consideration of due process. A court of competent jurisdiction has the power to

<sup>1</sup> 5 USC 552(b).

<sup>2</sup> Section 8(b), 15 USC § 717g(b); and see *Electric Bond & Share Co. v. S.E.C.*, 303 U.S. 419 (1938)

<sup>3</sup> *Iunter v. Shell Oil Co.*, 198 F. 2d 485 (CCA5, 1952); *Pratt v. Shell Petroleum Co.*, 100 F. 2d 833 (CA10, 1939).

<sup>4</sup> It is interesting to compare the Subcommittee's demand with the expressed intent of Congress in enacting the Freedom of Information Act. In reference to the exemption under Section (b) (1), House Report No. 125, 90th Cong., 1st Sess., at page 10 stated:

"It would also include information which is given to an agency in confidence, since a citizen must be able to confide in his government. Moreover, where the government has obligated itself in good faith not to disclose documents or information which it receives, it would be able to honor such obligations."

The House Report also referred to Section (b) (9) and noted the contentions of witnesses that disclosure of exploratory findings of oil companies would give speculators an unfair advantage over companies which spent millions of dollars for exploration. The Senate Report, No. 248, 90th Cong., 1st Sess., page 2, said:

"The purpose of clause (9) is to protect from disclosure certain information which is highly valuable to several important industries and which should be kept confidential when it is contained in Government records."

issue such orders as are necessary to preserve the rights of the parties pending adjudication of the matter before it.

RUSH MOODY, Jr., *Commissioneer*.

ALBERT B. BROOKE, Jr., *Commissioner*.

Senator DOLE. I am wondering if the witnesses on behalf of the Gas Supply Committee would be inconvenienced if we recessed until 2 o'clock.

Mr. HAMMOND. That would be agreeable with both the witnesses.

Senator DOLE. What about Mr. Partridge on behalf of the American Gas Association?

Mr. PARTRIDGE. That would be agreeable with me.

Senator DOLE. I have a meeting at noon, and I think by 2 o'clock Senator Gravel will have returned, so the subcommittee will recess until 2 o'clock.

[Whereupon, at 12 noon, the subcommittee was recessed, to reconvene at 2 p.m. the same day.]

#### AFTERNOON SESSION

Mr. GRAVEL. The hearings will come back to order, and our next witness will be Mr. Hammond and Mr. Vaughan on behalf of the Gas Supply Committee.

Mr. Hammond and Mr. Vaughan, you can have other people join you at the table if you want, or you can just hold forth by yourselves, whichever is easier.

Mr. HAMMOND. We will try it this way, Mr. Chairman. Thank you.

Mr. GRAVEL. I am very happy to have you both here. I am sorry I had to absent myself for Mr. Nassikas' testimony this morning. I understand that the Chairman of the Federal Power Commission supports deregulation of natural gas, and I think that is very novel and noteworthy, and I wish I had been here to applaud that statement. I look forward to the fine testimony you gentlemen can give us this afternoon. Please proceed at your speed, and I will question you at the end of your statement.

#### **STATEMENT OF MR. J. P. HAMMOND, ASSOCIATE GENERAL COUNSEL, STANDARD OIL CO. (INDIANA), ON BEHALF OF GAS SUPPLY COMMITTEE; ACCOMPANIED BY MR. JOHN R. REBMAN, COUNSEL, EXXON CO.**

Mr. HAMMOND. Fine, thank you, Mr. Chairman.

I am J. P. Hammond, associate general counsel of Standard Oil Co. in Indiana, and Mr. Kenneth Vaughan appears with me. We appear for the Gas Supply Committee, with respect to the provisions of your bill dealing with natural gas deregulation.

The Gas Supply Committee is an ad hoc group of gas producers, both large and small, who have joined together to present their views to Congress on natural gas legislation. Both Mr. Vaughan and I have submitted complete texts of statements to you which we would like to have incorporated into the record. We both have short summaries of those statements that we would be prepared to give orally.

Mr. GRAVEL. Very good.

Both of these statements will be incorporated in the record. Proceed on your summaries as you wish.

Mr. HAMMOND. Thank you.

S. 2806, with certain clarifications, would be a helpful step in the direction of alleviating the serious shortage of natural gas. The Gas Supply Committee believes, however, that it is imperative to more speedily and effectively mitigate the growing natural gas shortage. Therefore, we recommend the legislative proposal which I have attached as appendix A to my testimony, and this would deregulate new gas immediately and would phase out regulation of old or flowing gas over a period of 4 years.

In my judgment—

Mr. GRAVEL. That is appendix A, that is the bill right here?

Mr. HAMMOND. Yes, sir, appendix A attached to my testimony.

In my judgment, complete decontrol of producers such as recommended by the Gas Supply Committee would best serve the public interest for the following reasons.

One, it is greatly in the national interest to avoid excessive dependence on foreign sources of supply by expeditiously developing additional domestic natural gas reserves. This will require adequate incentives for major expansion of exploration and development. Maximizing exploration for and development of the domestic potential is far better for the consumer than any available alternative. Benefits to consumers will be greater even though all natural gas prices reach competitive market levels. Pipelines will be more fully utilized, reducing consumer costs. Objectives of national security, a more favorable balance of payments, and protection of the environment are helped, and general economic growth is encouraged. Wasteful regulatory delays and uncertainties are avoided. Much of the substantial capital needed will be internally generated, if producers are allowed to collect the prices provided for in their contracts.

Second, adequate consumer protection exists in regulatory controls which will remain on natural gas at both the pipeline and distribution company levels. There will be increased constraints on rising producer prices as pipelines must obtain FPC approval of any new facilities to connect additional supplies of gas, even after producer deregulation. There also are contractual limitations on price increases in most existing gas sales agreements. Many contracts do not contain price re-determination or indefinite pricing clauses because proscribed by FPC orders, and thus they are price limited unless renegotiated. There are the further restraints of competition between producers in the marketing of new gas supplies.

Third, the price of natural gas at the wellhead on the average currently is only about 17 percent of the cost at the burner tip to the consumers. Thus, even a substantial increase in wellhead prices for all natural gas would amount to only a relatively small percentage annual increase in the cost to the consumer.

Fourth, a major factor in the soaring demand and resultant shortages of natural gas has been the extremely low price fixed for natural gas as compared with the price that must be paid for less desirable substitute fuels. The national interests clearly are better served by paying more for additional domestic natural gas supplies than by paying higher prices for less desirable substitutes and in addition

bearing the increasing cost of pipeline transportation for the continually declining domestic supplies.

The Federal Power Commission's restrictive pricing policies under the present Natural Gas Act have been the root cause of present gas shortages in two correlative ways. On the one hand, through arbitrary, irrelevant, and inapplicable regulatory criteria, these policies have deprived producers of the funds required to find and develop the Nation's vast store of potential gas resources. On the other hand, depressed prices, relative to other energy fuels, have overstimulated the demand for natural gas, often for inefficient and wasteful purposes. In addition, these regulatory procedures have added immeasurably to the uncertainties and risks of conducting business in this already high cost, high risk enterprise.

The Gas Supply Committee believes that natural gas users would benefit most from complete deregulation of both new and flowing gas. Deregulation of new gas is necessary to provide producer incentives. Deregulation of flowing gas will increase ultimate recovery from and encourage further exploration and development on already committed acreage. Deregulation is essential to provide the investment funds needed now for expanded exploration, development, and production of new gas, just as the earnings from new gas contracts will provide seed capital for the next generation of supplies.

Deregulation would also help to assure more efficient utilization of natural gas supplies. A competitive price would be the most effective means of allocating gas to its most beneficial uses, and would promote conservation through the use of more efficient burners, better insulation and the like.

Increased supplies and more efficient use of natural gas would help to reduce air pollution, diminish national dependence on less secure foreign supplies, and lighten the burden on the U.S. balance of international payments caused by excessive imports of oil and natural gas.

While immediate total deregulation offers the best promise of bringing about the greatest degree of improvement in gas supply in the shortest period of time, in order to assure that the financial impact of deregulation is spread over a reasonable period, the Gas Supply Committee recommends legislation to phaseout regulation of flowing gas over a period of 4 years.

Our proposal is that legislation be enacted to immediately deregulate four categories of new natural gas: First, deliveries of gas under new interstate contracts made after April 15, 1973; second, deliveries of gas under expired interstate contracts where renewed after April 15, 1973; third, gas produced and sold interstate from wells commenced on or after April 15, 1973; and four, deliveries of gas under small contracts, those involving 10 million cubic feet per day or less, effective as of March 18, 1971.

Such deregulation of new gas would specifically enable interstate pipelines immediately to compete with intrastate markets for the purchase of available gas supplies and would enable interstate pipelines to offer higher prices to encourage drilling of new wells on already contracted acreage. The exemption of small contracts will have a two-fold beneficial effect: It will relieve producers and the FPC of heavy administrative burdens related to relatively small contracts, and it will encourage smaller producers to expand their exploratory activities. By making the effective date retroactive to March 18, 1971, many

small producers will be relieved of the potential consequences of judicial reversal of the FPC's small producer exemption, which is now in the courts.

The phaseout of regulation over old or flowing gas over a period of 4 years would be accomplished by allowing producers under each jurisdictional contract, to charge in the first year the contract price for 25 percent of the gas delivered, and the applicable regulated rate for the remaining 75 percent. In the second year the proportion would increase to 50 percent of the contract rate, in the third year to 75 percent until in the fourth year all deliveries are deregulated.

This procedure would enable producers to anticipate increased revenues which will serve as a significant stimulus to increased exploration activities. It will also assure consumers that the increase in field price, which is necessary to bring forth increased gas supplies, will be spread over a period of years.

As indicated by the full text of our proposals attached to my testimony, provision is made for pricing of pipeline affiliate production, for prohibition of reduction in rates once approved and for new standards for regulation during the phaseout period.

In summary, only adequate prices for natural gas sold under existing contracts and from new wells can provide the capital funds for the vastly expanded and accelerated domestic exploration and development effort needed. It is not in the public interest to accept a domestic shortage as a permanent state of affairs, and only through a major exploratory effort can we even begin to reverse present supply trends. Regulation and unwise policies have brought on the shortage. Consumers, who are supposed to be protected by regulation, are the ultimate victims.

In my full prepared statement I have provided a number of detailed suggestions for clarifying the proposed text of S. 2806. These suggestions are more of language than substance, and I will not review them at this time.

This completes my oral presentation. Mr. Kenneth Vaughan will appear next for the Gas Supply Committee. I could either respond to questions now or perhaps you would want to hear Mr. Vaughan and question the two of us.

Mr. GRAVEL. Yes. I would rather hear Mr. Vaughan and then question both of you at the same time.

[Mr. Hammond's prepared statement, with attachment, follows. Hearing continues on p. 1268.]

PREPARED STATEMENT OF J. P. HAMMOND ON BEHALF OF THE GAS SUPPLY COMMITTEE

My name is J. P. Hammond. I am Associate General Counsel of Standard Oil Company (Indiana). I appear today, however, on behalf of the Gas Supply Committee.

I favor total deregulation of gas producers for the reasons I will give later. S. 2860, with certain clarifications, would be a helpful step in the direction of alleviating the serious shortage of natural gas. To more speedily and effectively mitigate the growing natural gas shortage, the Gas Supply Committee recommends legislation in the form of the proposal attached hereto as Appendix A. This legislation would deregulate "new" gas and phase out regulation of "old" or flowing gas over a period of four (4) years. I will discuss later the provisions of this proposal which I favor.

Excessively low wellhead prices imposed by Federal Power Commission (FPC) regulation have caused the demands for natural gas to soar and have dampened

the incentive to provide adequate capital for enhanced exploration needed to maintain a natural gas supply-demand balance. There should be expeditious relief for natural gas producers from onerous FPC regulation which will inure to the benefit of consumers by accelerating the exploration for, and production of additional natural gas supplies to serve unmet demands. Deregulation is essential to alleviate the present supply-demand imbalance with expedition, will be a less costly burden on consumers than perpetuation of a shortage, and increased gas supplies will have a significantly favorable effect on the environment. As I will explain later, when I analyze the provisions of S. 2860, certain amendments are needed to eliminate ambiguities in and to conform that bill to the realities of gas producer operations. I favor the proposal attached hereto as Appendix A and recommended by the Gas Supply Committee because it does conform with the realities of the gas producer business.

#### 1. NATURAL GAS ACT—PURPOSE AND INTENT

The Natural Gas Act was enacted into law on June 21, 1938. Its genesis was a legislative concern expressed as early as 1928 that an unregulated gap existed in the natural gas industry, i.e., states were without power to regulate the rates at which the interstate pipeline companies sold gas to local distributors for resale. In the mid-1920's the Supreme Court had held that such power belonged exclusively to the Federal Government, but such power had not been implemented by legislation.

The identical reports of the House and Senate Committees comprising the legislative history of the Act make clear that its purpose and intent was to close the gap which existed between federal and state regulation over the sale for resale of gas that is a part of interstate commerce. In reference to the jurisdictional scope of the Act, Senator Wheeler, then Chairman of the Committee on Interstate Commerce, stated during debate on the bill: "It does not attempt to regulate the producers of natural gas or the distributors. . . . It is limited to transportation in interstate commerce and it affects only those who sell gas wholesale." 81 Cong. Rec. 9312 (1937).

The Act was interpreted by the FPC and the industry to be inapplicable to sales by independent producers in or near the fields of production. However, the United States Supreme Court, by a divided 5-3 decision, held differently on June 7, 1954. On two occasions, Congress enacted legislation to exempt from regulation sales of natural gas by independent producers. In each instance the bills were vetoed by the President. As a result, for some two decades now, the Federal Power Commission has been struggling ineffectively with attempts to solve the regulatory problems imposed upon it by that decision. As a consequence, today we have a serious natural gas supply-demand imbalance, to the detriment of all types of consumers of natural gas.

#### 2. THE NATURAL GAS SUPPLY SHORTAGE

At the time regulation was imposed in 1954 the proven reserves were 23 times annual production. During the postwar years of 1946-1953, new proven reserves added to the supply equaled more than twice the net production for that period. New pipelines were being built; requirements of existing pipelines were being met; and consumers of this clean, premium fuel enjoyed an abundant supply.

The intervening years, however, have taken their toll. Of greatest significance is the fact that new reserves added have been less than net production for each of the last five years. For the years 1968 through 1972, production has totaled 106 trillion cubic feet, but reserves additions have been only 50 trillion cubic feet. Commencing in the winter of 1971-72, extensive curtailments of deliveries to existing customers have been put into effect by natural gas pipelines and natural gas distributors. Denial of new service and limitations on increases in existing service are now common occurrences. Currently 15 interstate pipelines are experiencing increasing difficulties in obtaining sufficient gas to maintain reliable service, and these pipelines serve most of the major metropolitan areas of the United States. In its recent Orders (No. 491 issued September 14, 1973 and No. 491-A issued September 25, 1973) designed to cope with the immediate threat to the entire consuming public because of the critical magnitude of the current gas supply deficiency, the FPC pointed out the increasing curtailments. Net curtailments of firm requirements of customers from April 1972 to March 1973 were about 0.8 trillion cubic feet, projected to increase to 1.2 trillion cubic feet for the same period 1973-1974. According to the FPC staff's report of July 16, 1973, acute regional curtailments were indicated for the New England, Appalachian, Great Lakes, and

Northern Plains regions. The FPC found such curtailments will result, as they did last year, in severe economic and environmental consequences, such as the closing of schools and factories.

Yet, in the midst of this shortage, there are untapped potential gas supplies in the United States. The Potential Gas Committee estimates in 1973 that the potential supply of natural gas remaining to be found in the U.S. (including Alaska) is 1,146 trillion cubic feet, compared to 1972 consumption of 23 trillion cubic feet. Thus, the domestic undeveloped resource base is substantial. The decline in available gas supplies is not due to lack of potential, but is due to lack of needed incentives. If deregulated, natural gas prices will seek competitive market levels and domestic gas exploration and development activity will be maximized. I believe this is the most expeditious and least expensive approach toward alleviating the costly natural gas shortage and will best serve both the short-term and long-term needs of natural gas consumers.

The alternatives to deregulation are continued shortages, increasing consumers costs for existing supplies, and higher costs for less desirable substitutes. Foreign sources of supplemental supply could more than double by 1985, provided the Canadian authorities (who are currently restricting further exports) permit continued and increased exports to the United States, and provided technical problems of transporting natural gas from remote Arctic regions can be overcome. A few projects have been approved by the FPC and others are being developed to import liquefied natural gas (LNG) from foreign sources (Algeria, Indonesia, Libya, Nigeria, the North Sea, Trinidad, Venezuela, and Russia). Before the events following the Arab-Israeli war in October 1973, it was projected that these supplemental supplies will cost, at the point of import, from 90¢ to \$1.50 per Mcf which is five to eight times the average price paid to domestic producers in 1972. New projections have not been published, but they will undoubtedly be higher still. In addition, there are projects to manufacture synthetic gas from naphtha, liquid hydrocarbons, and coal, but all of these are at several times the cost of current domestic supplies.

Highly significant, especially to the consuming public, is the fact that such foreign imports and synthetic alternatives are much more costly than domestic natural gas. Events of the past four months have demonstrated that reliance on foreign supplies of natural gas involves serious national security considerations, threats to our national economy, and a substantial adverse impact on the balance of payments. In other words, today and for the future, development of additional domestic natural gas will remain the best alternative, for consumers and the nation.

### 3. PROVISIONS OF THE PRESENT NATURAL GAS ACT

Let me briefly review the basic provisions of the Natural Gas Act and how those provisions have been administered by the Federal Power Commission which will show why decontrol is essential and in the public interest. There are three key sections of the Natural Gas Act which make up the basic structure of regulation.

*Section 7* requires prior Federal Power Commission approval and issuance of a Certificate of Public Convenience and Necessity before jurisdictional deliveries may be commenced. In the past, about one thousand applications have been filed under this section each year, and long delays and onerous price conditions have been the general pattern of Commission action. The long regulatory delays, price conditioning of certificates, and the great economic pressures to commence receiving revenues from production forced producers to seek temporary certificates pending final decision upon the application, not knowing the price ultimately to be permitted. Most of these temporary certificates were subject to retroactive adjustment if the price ultimately approved was less than the price initially permitted to be collected under the temporary certificate. Once deliveries commence, the producer may not terminate sales even though he is dissatisfied with the price approved when the Commission's final order is issued, because *Section 7(b)* requires a producer to continue deliveries until the Commission approves abandonment.

*Section 4* of the Act comes into play once deliveries commence. Natural gas sales contracts are typically of 20 years' duration or are for the life of production from the lease. The parties quite naturally include provisions for future price increases over the life of the contract. The Commission has outlawed nearly all indefinite pricing clauses, such as cost-of-living based changes. Even as to fixed price changes; however, before a contract price increase may be collected, notice must be filed with the Commission, and the Commission may suspend the effectiveness of the price increase for up to five months. After the suspension period, the increase may be collected but subject to refund pending a hearing to be held some



time in the future. In the past, the Commission has received from 6,000 to 12,000 of these rate increase filings each year.

Section 5 gives the Commission power to investigate and to modify or change any rate of a natural gas company. It may prospectively modify or change a rate even if that rate has already been approved in a Section 7 certificate proceeding, or in a Section 4 rate increase hearing, or even in a prior hearing under Section 5.

A producer, therefore, is prevented from even contracting for price increases that will protect him against the future uncertainties of a long-term sale. In addition, a producer can *never* be assured of the price he will receive for his natural gas, of the period of time he may collect any particular price, of the amount of his potential refund exposure, and of the term over which he must continue deliveries. These uncertainties have been a source of great frustration to producers, have destroyed confidence in the regulatory process, and have been major disincentives to increased exploration for and development of domestic natural gas.

#### 4. HISTORY OF PRODUCER REGULATION UNDER THE NATURAL GAS ACT

A brief résumé of past and present Federal Power Commission efforts to fix just and reasonable ceiling prices for producers will further highlight the need for modifications of the Natural Gas Act.

At the outset of independent producer regulation, the FPC sought to fix the wellhead price of natural gas for individual companies using the traditional utility cost of service approach by which standard it regulates interstate pipelines. After five years of effort the Commission concluded:

Experience of the Commission in this case, as well as in many other producer rate cases during the last five years, has shown, beyond any doubt that the traditional original cost, prudent investment rate base method of regulating utilities is not a sensible, or even a workable method of fixing the rates of independent producers of natural gas. (*Phillips Petroleum Company*, 24 FPC 542)

Therefore, in 1960 the Commission turned to its so-called "area rate" approach to regulation of independent producers' wellhead prices. It divided the nation into geographical areas and announced that it would attempt to set just and reasonable rates for producers based on the reasonable financial requirements of the gas producing industry. This experiment likewise failed as it soon degenerated into complex, protracted adversary proceedings dealing with arbitrary allocations of costs between oil and gas. Just and reasonable rates were again attempted to be fixed by translating into rate ceilings imprecise and unreliable estimates of the unit cost of producing gas in each area or in combined areas. The resulting prices were so low as to stifle exploration and development programs for new gas supplies. Inadequate economic incentives thus have resulted in serious supply-demand imbalance, with this nation going from an abundance of natural gas to a serious shortage. Because FPC regulation has established bargain prices of natural gas, users have turned to natural gas instead of other fuels, aggravating the shortage and delaying the development of acceptable substitutes.

Cost-based regulation simply will not work for gas producers. Costs have no valid relation to results as one well may cost millions of dollars and find nothing, while a modestly costly project may discover a valuable natural gas field. In addition, natural gas is frequently found with oil and allocation of costs to the respective products is largely arbitrary.

The impossible problem is that the FPC is struggling to regulate a high-risk, competitive gas producing business under a law and standards applicable to price regulation for utilities with fixed investments in facilities and a monopoly position with franchised territories. It is no wonder the nation is facing a severe shortage of clean-burning natural gas, at the very time this premium fuel is so badly needed to meet the clean air requirements of today's environmental laws.

In a number of recent orders the FPC implicitly has admitted the inadequacy of its cost-based ceilings to elicit needed additional gas supplies. In its opinion, No. 595 (pp. 10-11) in the Texas Gulf Coast Area Rate Proceeding, the FPC clearly found that unit cost estimates are not precise, but arbitrary, and that the allocation of costs between oil and gas were subject to wide margins for error, both as to data and as to method or formula used. The D.C. Circuit in reviewing that opinion found that the traditional cost of service methodology has simply proved inadequate. In additional ways, the FPC has acknowledged that its repressive ceiling prices are inadequate. Under its Order 431, issued April 15, 1971, the Commission has allowed limited-term sales by producers at prices substantially above the obsolete area rates. Under its Order 455 Optional Certificate

Procedures, the FPC has granted permanent certificates at rates above existing, inadequate area rates. However, Order 455 is being attacked in the courts and as with most other FPC orders, lengthy litigation may be predicted, creating additional years of uncertainty. The D.C. Circuit in the *Texas Gulf Coast Area Rate Cases*, *infra*, (p. 26) notes that Order 455 seems to undercut the premise of Area Rate regulation in substantial measure.

In Notice of Proposed Rulemaking, Docket R-389B, issued April 11, 1973, the Commission proposed to fix a single uniform just and reasonable ceiling price for all producing areas on a nationwide basis for natural gas produced from wells commenced on and after January 1, 1973. Comments submitted by interested parties have recommended ceiling prices above area rates, but the validity of the Commission's rulemaking procedure has already been questioned.

By notice issued May 23, 1973, in Docket No. R-478, the Commission instituted another nationwide rulemaking to establish just and reasonable rates for old "or flowing gas, i.e., natural gas produced from wells commenced before January 1, 1973." Validity of this type of ratemaking is also being questioned. In this docket the FPC has again required reporting of voluminous cost data despite the fact that such historical cost data collection and utilization in the past has proven not to be useful or functional in producer rate regulation.

The most recent proof of the utter futility of regulation of independent producers under the present Natural Gas Act is reflected in the District of Columbia Circuit opinion in the *Texas Gulf Coast Area Rate Cases*. (*Public Service Commission of New York v. FPC*, No. 71-1828, *et al.*, D.C. Cir. August 24, 1973, Slip Opinion). That proceeding was instituted by Commission order in November 1963, decided by an Administrative Law Judge in September 1968, and by the FPC in May 1971. The rates prescribed by the Commission in that case were grounded largely on a cost data questionnaire covering producer operations in 1962.

In August 1973, the U.S. Court of Appeals for the D.C. Circuit issued its decision remanding the matter to the FPC for further consideration. That's 11 years after the case started. Producers in this area still have no idea what the lawful rates might be. It is not surprising that two decades of independent producer regulation by the FPC and by a variety of Courts has yielded a 50% decline in gas exploration and an ultimate shortage of natural gas.

The U.S. Supreme Court in *Permian* characterized the Natural Gas Act as "ill-suited" to regulation of independent producers, and the Court of Appeals in the *Texas Gulf Coast Area Rate Cases* stated that: ". . . in the context of natural gas regulation, the traditional methodology has simply proved inadequate.", (p. 107) that "it may be that the Commission is unable to supply the evidentiary basis and reasoned justification we think the Act requires, that it has neither the methodological tools necessary for the regulation in which it is engaged nor the means of acquiring the information necessary to their exercise. Indeed, it may be that regulation simply cannot meet the statutory goals set for it." (p. 110)

Thus the Court found that despite 11 years' labor by the Commission and the parties, the result still did not meet the statutory requirements of the present Natural Gas Act. Most significantly, the Court clearly seemed to be of the view that perhaps there was no possibility of effective regulation of producers and that it is the province of Congress to alter or repeal the Natural Gas Act (pp. 39; 94).

The Congress should bring a halt to these costly and futile experimentations by FPC with cost-based regulation which have proven unworkable for natural gas producers. Natural gas producers should be deregulated by Congress so that the critical supply-demand imbalance may be corrected. The public interest will be best served by making more supplies of clean burning natural gas available as soon as possible.

From the very outset of regulation of natural gas producer prices by the FPC, producers have forecast repeatedly that the ultimate consequences would be a shortage of natural gas supplies unless producers were afforded adequate incentives to explore for additional natural gas reserves. For background, I would respectfully refer the Subcommittee to the very illuminating article in the *Public Utilities Fortnightly* of August 27, 1964, Volume 74, Number 5, entitled "Regulation and Our Dwindling Gas Supply", by H. K. Hudson and R. L. Howard. I would further cite you to the initial briefs filed by natural gas producers with the Federal Power Commission in the area rate cases throughout the 1960's in FPC Docket Nos. AR61-1, AR61-2, AR64-1, AR64-2, and AR67-1. The supply consequences of the FPC's pricing policies, which producers foretold, recently were confirmed by the analysis of those FPC policies in an article entitled "The Natural Gas Shortage and the Regulation of Natural Gas Producers," in the April 1973 issue of *The Harvard Law Review*.

Commission records will bear out that the gas producers have continuously forecast, since the imposition of FPC regulation, that the ultimate consequences of short-sighted repressive price regulation could only be a shortage of natural gas supplies contrary to the public interest. Producer efforts to alert the public of the consequences of such regulation have been characterized as "crying wolf" just to obtain improved producer natural gas prices. Despite these warnings, the Commission adopted the now-discredited contentions that there was a "glut" of gas and no foreseeable shortage, and that producer prices should be fixed at artificially low levels based on average unit cost estimates. This policy of the FPC, initiated in the 1960's, resulted in the low gas prices for the short term. However, this action increased demand and restrained development of additional supplies, and was a major factor contributing to the present serious gas supply-demand imbalance.

##### 5. LEGAL OBLIGATIONS TO MARKET NATURAL GAS

It has been alleged that producers, in an effort to justify a higher price for gas and in expectation that increased prices will be forthcoming, are consciously delaying the exploration, development, production, and sale of potential gas reserves thus creating the impression of a gas shortage.

To suggest that any responsible producer-lessee would by conscious design delay the prudent exploration, development, production and sale of known and prospective natural gas reserves reflects complete lack of knowledge of the economic compulsion on producers to market any gas found as soon as possible because of the time value of money and because of the stringent legal obligations imposed on a producer-lessee under the usual oil, gas, and mineral lease. These legal obligations give full effect to considerations of prudent operation, which in turn depend on such factors as prices of products, volume of production expected, and availability of markets. It would be irrational for producers to pursue the course of action alleged for the simple reason that if producers resorted to such "holding off the market" tactics, they would suffer severe financial loss due to the forfeiture or cancellation of valuable mineral leases.

To properly appreciate the issues involved and to place them in their proper perspective, it is essential to understand that the exploration and development of oil and gas properties has, with rare exception, occurred under the terms of oil, gas, and mineral leases. Such leases are the legal vehicles by which a producer-lessee acquires the right to enter upon the premises to explore for, and if found, to develop, produce, and market the oil and gas which may underlie the property described in the lease. For example, in Louisiana, the "exclusive right" to explore and develop lands for minerals, together with the concomitant right ultimately to produce and market same if found, belongs to the landowner or to a mineral servitude owner. Absent a lease granted by such parties a producer would not have the legal right to do any of these things (unless he purchased outright the land or the mineral rights therein, which is uncommon).

Under the terms of these leases the producer-lessee assumes certain express obligations to the lessor and there is additionally imposed by law, because of the nature of the basic relationship between lessor and lessee, a number of "implied covenants or obligations" which the lessee is bound to discharge, whether or not set out in the lease, on pain of suffering total or partial cancellation of the lease, monetary damages, or both.

It is reasoned that since an oil and gas lease invests the producer-lessee with the "exclusive" right to drill on the land covered by the lease, and the lessor is contractually rendered powerless to exercise that right, the lessor's reasonable expectation of development of the mineral potential and the monetary return to be realized therefrom—repeatedly identified by our courts as the principal or primary consideration for granting the lease—should be afforded protection by law.

The jurisprudence has evolved several well-defined implied obligations. They are:

- (1) The obligation to drill additional wells on the leased premises once production is established;
- (2) The obligation to protect the leased premises from uncompensated drainage of oil and gas occasioned by wells located on adjoining lands; and
- (3) The obligation to produce and market the oil and gas discovered on the leased premises.

The underlying premise of all these obligations is the recognition that pecuniary gain to the lessor—the principal consideration for the lease—depends entirely upon the diligent operation of the leased premises by the producer-lessee. If

the lessee permits drainage to occur, this consideration is diminished. If the product once discovered is not marketed, no further consideration is received by the lessor. And, if the lessee fails to diligently explore and develop, the potential of the landowner's property is not fully realized. Once production is established the lessee is not permitted to rest on his laurels. To avoid the risk of money damages or judicial cancellation of his lease as to undeveloped areas, the lessee must within a reasonable period of time commence additional drilling operations to further develop the remainder of the leased premises. He must, in the words of one court, conduct all such operations as would a "reasonably prudent operator in the same or similar circumstances having due regard for the interest of both contracting parties." And, as stated a little differently by another court, "time and prompt development become of the essence of oil and gas contracts once production has been found."

The following brief quotation taken from the jurisprudence best expresses the essence of the rule, viz:

The justification for the respondent's position is that the geologic data and the experience upon surrounding lands are both unfavorable to the discovery of oil or gas upon the east half of Section 16 (the 320-acre tract). The respondent's officers state that they desire to hold this tract because it may contain oil; but they assert that they have no present intention of drilling at any time in the near or remote future. This attitude does not comport with the obligation to prosecute development with due regard to the interests of the lessor. The production of oil on a small portion of the leased tract cannot justify the lessee's holding the balance indefinitely and depriving the lessor not only of the expected royalty from production pursuant to the lease, but of the privilege of making some other arrangement for availing himself of the mineral content of the land. *Saunders v. Mid-Continent Petroleum Corp.*, 292 U.S. 272, 54 S.Ct. 671, 78 L.Ed. 1255, 93 A.L.R. 454 (1934).

Other authorities in point are *Wier v. Grubb*, 228 La. 254, 82 So. 2d 1, *Sohio Petroleum Company v. Miller*, 237 La. 1013, 112 So. 2d 695, and *Fox Petroleum Co. v. Booker*, 123 Okla. 276, 253 Pac. 33, 38, quoted with approval in *Wier v. Grubb*, 82 So. 2d 1, 7.

Withholding of gas production from the market is virtually impossible because the producer cannot delay production if a reasonable market is available. Again the underlying rule is that the lessee must operate the leased premises as a prudent operator for the mutual benefit of lessor and lessee and is obligated to market the production at the best market price available, assuming there is a market. Actually, there is very little litigation on this point for several reasons. First and foremost is the fact that the lessee is anxious to begin receiving revenues because of the time value of money. Secondly, because of the fact that a great many producing wells, both oil and gas, are more often than not completed in reservoirs from which other operators are also producing, curtailment of production would mean a monetary loss to the producer because of drainage. And thirdly, if production in paying quantities ceases for 60 or 90 days, depending on the lease terms, the lessee may lose the lease.

Under Sections 5 and 8 of the Outer Continental Shelf Lands Act, the authority to administer the outer continental shelf lands, and to grant oil and gas leases thereon, is vested by law in the Secretary of the Interior, and the Secretary in turn has issued extensive leasing and operating regulations which are found in 30 C.F.R. 250 et seq., 43 C.F.R. 2234 5-3, and 43 C.F.R. 3380 et seq.

Section 3(c) of the federal oil and gas lease form spells out the drilling obligations imposed on the lessee. The provisions of the lease in this respect for the most part mirror the pertinent regulations, i.e., 43 C.F.R. 3387.3-2(a), 3387.3-2(c), and 3387.3-4 and 30 C.F.R. 250.33(a), 250.33(b), and 30 C.F.R. 250.34 and 250.35.

The federal lease form contains an express provision corresponding to the implied obligation to develop:

After due notice in writing to diligently drill and produce such other wells as the Secretary may reasonably require in order that the leased area or any part thereof may be properly and timely developed and produced in accordance with good operating practices. (Section 3(c)(2))

If the lessee fails to comply with any provision of the lease, the Outer Continental Shelf Lands Act or the pertinent regulations, the lease is subject to cancellation. Under Section 5(b) of the Outer Continental Shelf Lands Act, 43 C.F.R. 3386.2, 30 C.F.R. 250.80, 250.81, and 250.82 and Section 10 of the lease, the Secretary, upon the giving of a thirty (30) day notice of default is authorized to cancel nonproducing leases, subject to judicial review. And in the instance of a

producing lease, it may be cancelled by appropriate proceeding before the United States District Court having jurisdiction. As noted previously, the lessor also has the right to invoke any other legal or equitable remedies available which may include the right to assert the forfeiture of the lease and a claim for monetary damages, or both, in the event a violation of the implied obligations can be shown.

With respect to the implied obligation to market once production is established on a federal lease, the same general rules apply and, unless a reasonable market is not available, the lessee must produce the well. In this connection, cognizance should be taken of Special O.C.S. Order No. 4, dated August 28, 1969, issued by the Supervisor pursuant to 30 C.F.R. 250.11 and 250.12 which permits the extension of a lease beyond its primary term even in the absence of actual production, where transportation facilities are not available to market the product, or a well capable of producing has been abandoned temporarily to facilitate proper development by the construction of a platform or otherwise. Under O.C.S. Order No. 4 the Supervisor may approve a suspension of production and extension of the lease provided at least one well has been drilled on the lease and determined to be capable of being produced in paying quantities. The order thereafter sets out fairly detailed criteria which must be met in order for the well to qualify as a well capable of producing in paying quantities. During the period of such suspension, the lessee must continue to pay rental or minimum royalty fixed at the discretion of the Supervisor and such payments may not be recouped out of subsequent production royalties. In summary, it is fair to say that the basic obligations imposed on the lessee under a federal lease covering outer continental shelf lands are not materially different from those which rise under the ordinary fee-lands lease or the leases used by the State of Louisiana.

The foregoing analysis is important not merely because it demonstrates the error of certain arguments but more so because it underscores the danger of placing any substantial credence upon the views of persons who are totally unaware of the circumstances under which exploration, production, and marketing of natural gas take place.

#### 6. ANALYSIS AND EXPLANATION OF THE ATTACHED LEGISLATIVE PROPOSAL RECOMMENDED BY THE GAS SUPPLY COMMITTEE

As I have shown, the Federal Power Commission's restrictive pricing policies under the present Natural Gas Act have been the root cause of present gas shortages in two correlative ways. On the one hand, through arbitrary, irrelevant, and inapplicable regulatory criteria, these policies have deprived producers of the funds required to find and develop the nation's vast store of potential gas resources. On the other hand, depressed prices, relative to other energy fuels, have overstimulated the demand for natural gas—often for inefficient and wasteful purposes. In addition, these regulatory procedures have added immeasurably to the uncertainties and risks of conducting business in this already high-cost and high-risk enterprise.

The Gas Supply Committee believes that natural gas users would benefit most from complete deregulation of both new and flowing gas. Deregulation of new gas is necessary to provide producer incentives. Deregulation of flowing gas will increase ultimate recovery from and encourage further exploration and development on already committed acreage. Deregulation will provide the investment funds needed now for expanded exploration, development, and production of new gas—just as the earnings from new gas contracts will provide seed capital for the next generation of supplies.

Deregulation would also help to assure more effective utilization of natural gas supplies. A competitive price would be the most effective means of a locating gas to its most beneficial uses, and would promote conservation through the use of more efficient burners, better insulation and the like.

Increased supplies and more efficient use of natural gas would help to reduce air pollution, diminish national dependence on less secure foreign supplies and lighten the burden on the U.S. balance of international payments caused by excessive imports of oil and natural gas.

While immediate total deregulation offers the best promise of bringing about the greatest degree of improvement in gas supply in the shortest period of time, in order to assure that the financial impact of deregulation is spread over a reasonable period, the Gas Supply Committee recommends legislation to phase out regulation on flowing gas over a period of years.

The legislation recommended by the Gas Supply Committee would immediately deregulate four categories of "new" natural gas:

1. Deliveries of gas under new interstate contracts made after April 15, 1973.
2. Deliveries of gas under expired interstate contracts where renewed after April 15, 1973.
3. Gas produced and sold interstate from wells commenced on or after April 15, 1973.
4. Deliveries of gas under small contracts; i.e., those involving 10,000 Mcf per day, or less, (effective 3/18/71).

Such deregulation of "new" gas would enable interstate pipelines to immediately compete with intrastate markets for the purchase of available gas supplies and would enable interstate pipelines to offer higher prices to encourage drilling of new wells on already contracted acreage. The exemption of small contracts will have a two-fold beneficial effect: (a) relieve producers and the FPC of heavy administrative burdens related to relatively small contracts, and (b) encourage smaller producers to expand their exploratory activities.

The phase out of regulation over "old" or flowing gas over a period of four years would be accomplished by allowing producers under each jurisdictional contract to charge in the first year the contract price for 25% of the gas delivered and the applicable regulated rate for the remaining 75%. In the second year the proportion would increase to 50% of the contract rate, in the third year to 75%, until in the fourth year all deliveries are deregulated.

This procedure is acceptable because it permits producers to anticipate with certainty increased revenues which will serve as a significant stimulus to increased exploration activities. It will also assure consumers that the increase in field price—which is necessary to bring forth increased gas supplies—will be spread over a period of years.

Where the pipeline purchases gas from a pipeline-affiliated company, the pipeline could include in its resale rates the cost of gas purchased from affiliates only to the extent that such costs do not exceed prices paid to unaffiliated producers. A similar limitation would be placed on the pipeline's own production from new wells.

The proposal also provides needed assurance that when the FPC once finds a rate to be just and reasonable (as to gas not deregulated), such rate cannot be later reduced by further regulatory action.

This basic concept is carried over from the earlier "sanctity of contract" legislation supported by the Gas Supply Committee. It provides valuable certainty to producers that approved rates will not be later reduced, so that retention of present revenues may be depended on to finance new exploration programs.

The proposal prescribes a new standard for FPC regulation of natural gas that is not deregulated. This provision would prohibit the use of "cost of service" standards and would substitute more appropriate standards comporting with the economic realities of the gas producing industry such as the prices of alternate fuels and the premium qualities of natural gas.

This provision is necessary to preclude the possibility that the present or a future FPC would simply freeze the price of gas not deregulated.

#### I. ANALYSIS OF S. IIII

S. 2860 does not provide total deregulation, as does the Gas Supply Committee proposal, which I believe today's supply requirements demand. S. 2860 does represent positive and necessary steps, which in my judgment, should lessen the natural gas supply shortage by encouraging some expansion of domestic exploration and development programs. Thus, the legislation will to that extent serve the interests of the consuming public by reducing in some measure the burden on consumers because of the shortage. After some two decades of protracted, expensive and ineffective FPC regulatory efforts, there is an imperative need today, however, for deregulation as recommended by the Gas Supply Committee. Establishment of a free market will maximize domestic natural gas exploration, to the benefit of the gas consuming public.

The principal concept of S. 2860 is that gas from "new" wells, gas "newly" dedicated to interstate markets, and continued production of gas from "expired" contracts should be exempted from price regulation at the wellhead. A more detailed analysis of the provisions of S. 2860 may be helpful to the Subcommittee by reflecting the specific changes the legislation proposes to the Natural Gas Act ("Act"). The following analysis also shows the need to remove certain ambiguities.

Section 502(a) of S. 2860 amends Section 1(b) of the present Natural Gas Act (Act) to extend FPC jurisdiction to direct sales by deletion of the following language now in Section 1(b): "for resale for ultimate public consumption." It

further would add, at the end, language to exempt from FPC jurisdiction the sale of (1) gas dedicated for the first time to interstate commerce on or after the date of enactment; or (2) gas rededicated upon expiration of an existing contract on and after the date of enactment; or (3) gas produced from wells commenced on or after the date of enactment, provided such sale is made by a person whose principal business is not the transportation of natural gas in interstate commerce. Certain language in the Bill here requires changes which I will later suggest.

*Section 502(b)* amends Section 2(6) of the Act to extend FPC jurisdiction to direct sales by striking the last two words: "for resale." In addition, there is inserted, at the end, language "subject to the exception in Section 1(b) above." This Section also implements the concept in Section 502(a) that all sales in interstate commerce should be jurisdictional with certain exemptions specified.

*Section 502(c)* amends Section 2 of the Act by adding, at the end, a definition of affiliate, as follows:

(10) "Affiliate" of another person means any person directly or indirectly controlling, controlled by, or under common control with such other person. This definition is needed in conjunction with amendments to Sections 4 and 5 of the Act.

*Section 502(d)* amends Section 3 of the Act by striking from the first sentence "or import any natural gas from a foreign country" and from the second sentence "or importation." This language removes FPC authority and jurisdiction to regulate natural gas imports, but not its authority over exports.

*Sections 502(e) and (f)* amend Sections 4(e) and 5(a), respectively, of the Act to add identical provisions to the effect that (1) the FPC may not disallow in a natural gas pipeline purchaser's rates any natural gas purchase costs attributable to any gas sale exempt from regulation, except that purchased gas costs attributable to natural gas purchased from an "affiliate" as defined in Section 502(c) of the Bill may be disallowed to the extent that such costs exceed exempt natural gas sale charges by other parties not affiliated with the purchaser, and (2) the FPC would be prevented from disallowing in fixing a natural gas pipeline's rates, any costs attributable to natural gas wells commenced on or after the date of enactment on the purchaser's own properties, except to the extent that those charges exceed the rates and charges of a person not affiliated with that pipeline. An additional amendment to Section 5(a) provides that once a rate is found to be just and reasonable for a person not engaged in transportation of natural gas in interstate commerce, such rate cannot later be reduced if it has become final and no longer subject to judicial review. This "sanctity" provision prevents a later reduction in rates once found to be just and reasonable.

#### 8. RECOMMENDED CHANGES IN S. 2860

The language in Section 502(a) of S. 2860 providing for exemption of certain transactions including "the production or gathering of natural gas" may raise a question as to whether the exemption also applies to the act of processing natural gas for liquids extraction prior to delivery to an interstate pipeline and to the processing facilities. Therefore, I recommend the following changes to make clear that the exemption includes a producer, gatherer, or processor which is not engaged in the principal business of interstate transportation of natural gas by pipeline:

*Section 502(a)*. Section 1(b) of the Natural Gas Act is amended to read as follows:

(b) The provisions of this Act shall apply to the transportation of natural gas in interstate commerce, to the sale in interstate commerce of natural gas for domestic, commercial, industrial, or any other use, and to natural gas companies engaged in such transportation or sale, but shall not apply to any other transportation or sale of natural gas or to the local distribution of natural gas or to the facilities used for such distribution or to the production, gathering or processing of natural gas [dedicated] delivered for the first time to interstate commerce or [rededicated] sold or delivered in interstate commerce upon the expiration of an existing contract on or after the date of the enactment of the Energy Revenue and Development Act of 1973, or produced from wells commenced on or after such date for domestic, commercial, industrial or any other use, by any person whose principal business is not the transportation of natural gas in interstate commerce.

There is also ambiguity in the words "dedicated" for the first time to interstate commerce. The question is whether "dedicated" means date of execution of the gas sales contract, or the date of acceptance of a certificate, or the date actual

deliveries commence. It also is not clear whether the "on or after the date of enactment" applies to date of expiration of an existing contract, or to the date of a new contract that occurs after such expiration. The words "or produced from wells commenced on or after such date [date of enactment]" are apparently intended to refer to the previously used words "sale of natural gas" which apparently intended to refer to the previously used words "sale of natural gas" which apparently refers to an interstate sale only, as otherwise no exemption would be necessary. The above modification clarifies these points.

With the changes suggested above the Bill clearly would provide an exemption for "new" contracts, renewed contracts, and "new" production, and will be equally applicable to independent producers, pipeline affiliates, and pipeline production. Under this language, the FPC would have no jurisdiction over the sale of natural gas (1) delivered for the first time in interstate commerce, or (2) delivered in interstate commerce after expiration of a contract, on or after the date of enactment, or (3) produced from wells commenced on or after the date of enactment.

In Section 502(b) the word "exemption" would be preferable to the word "exception" and would be in conformance with Sections 502 (e) and (f) which use the term "exempt."

#### 9. SUMMARY AND RECOMMENDATIONS

A serious concern of gas producers is that regulation by the FPC of "old" or flowing gas would continue under S. 2860. There is the implicit danger of a freeze in such rates, which were established by methods already proven to be unworkable. In my considered judgment, complete decontrol of producers such as recommended by the Gas Supply Committee would best serve the public interest for the following reasons:

(1) It is greatly in the national interest to avoid excessive dependence on foreign sources of supply by expeditiously developing additional domestic natural gas reserves. This will require adequate incentives for major expansion of exploration and development. Maximizing exploration for and development of the domestic potential is far better for the consumer than any available alternative. Benefits to consumers will be greater even though all natural gas prices reach competitive market levels. Pipelines will be more fully utilized, reducing consumer costs. Objectives of national security, a more favorable balance of payments, a strong national economy, and protection of the environment are helped, and general economic growth is encouraged. Wasteful regulatory delays and uncertainties are avoided. Much of the substantial capital needed to explore for and develop new sources of gas supply will be internally generated, if producers are allowed to collect the prices provided for in their contracts.

(2) Adequate consumer protection exists in regulatory controls which will remain on natural gas at both the pipeline and distribution company levels. There will be indirect constraints on rising producer prices as pipelines must obtain FPC approval of any new facilities to connect additional supplies of gas, even after producer deregulation. There also are contractual limitations on price increases in most existing gas sales agreements. Many contracts do not contain price redetermination or indefinite pricing clauses because proscribed by FPC orders, and thus they are price limited, unless renegotiated. There are the further restraints of competition in the marketing of new gas supplies.

(3) The price of gas at the wellhead on the average currently is only about seventeen percent (17%) of the cost at the burner tip to the consumers. Thus, even a substantial increase in wellhead prices for all natural gas would amount to only a relatively small percentage annual increase in the cost to the consumer.

(4) A major factor in the soaring demand and resultant shortages of natural gas has been the extremely low price fixed for natural gas as compared with the price that must be paid for less desirable substitute fuels. Even at the higher area rates allowed by the FPC since 1970, the equivalent wellhead price of natural gas is less than 30% of the wellhead price of crude oil and 68% of the price of coal at the mine, based on Btu content. The national interests clearly are better served by paying more for additional domestic natural gas supplies than by paying higher prices for less desirable substitutes and in addition bearing the increasing cost of pipeline transportation for the continually declining domestic supplies.

Rather than leave flowing gas to the mercy of an administrative backwater, serious consideration should be given to the coupling of immediate new gas deregulation to a phasing out of flowing gas regulation over a period of years as proposed by the Gas Supply Committee legislation. Such a program would undeniably result in increases in wellhead prices. But by spreading these increases



over a period of years, the consumer impact will be minimized and gradual yet producers will be able to anticipate with certainty increased revenues from flowing gas and plan their exploration programs accordingly. These increases for flowing gas are essential to provide the enormous capital requirements needed for requisite expansion of gas exploration.

In summary, only adequate prices for natural gas sold under existing contracts and from new wells can provide the capital funds for the vastly expanded and accelerated domestic exploration and development effort needed. Only through such a major effort can we even begin to reverse present trends. It is not in the public interest to accept a domestic shortage as a permanent state of affairs. Regulation and unwise policies have brought on the shortage. Consumers, who are supposed to be protected by regulation, are the ultimate victims.

#### APPENDIX A

### GAS SUPPLY COMMITTEE

#### DRAFT OF A LEGISLATIVE PROPOSAL WHICH WOULD DEREGULATE NEW GAS AND PHASE OUT REGULATION OF GAS PRESENTLY FLOWING TO MARKET OVER A 4-YEAR PERIOD

A BILL To amend the Natural Gas Act to provide that the Act shall not apply to certain sales of natural gas in interstate commerce

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

*Section 1.* That section 1(b) of the Natural Gas Act is amended to read as follows:

“(b) The provisions of this Act shall apply to the transportation of natural gas in interstate commerce, to the sale in interstate commerce of natural gas for resale for ultimate public consumption for domestic, commercial, industrial, or any other use, and to natural-gas companies engaged in such transportation or sale, but shall not apply to any other transportation or sale of natural gas or to the local distribution of natural gas or to the facilities used for such distribution or to the production, gathering or processing of natural gas or to the sale or delivery of a natural gas (i) delivered for the first time in interstate commerce, or (ii) sold or delivered in interstate commerce upon the expiration of an existing contract on or after April 15, 1973, (iii) produced from wells commenced on or after April 15, 1973, or (iv) pursuant to a small producer contract, effective on or after March 18, 1971, where such sale or delivery of natural gas is made by a producer, gatherer or processor of natural gas whose principal business is not the transportation of natural gas by interstate pipeline.”

*Section 2.* Section 1 of the Natural Gas Act is amended by adding at the end thereof the following new subsection:

“(d) On or after April 15, 1977, the provisions of section 1(b) shall not apply to any sale, or delivery, of natural gas in interstate commerce where such sale or delivery of natural gas is made by a producer, gatherer or processor of natural gas whose principal business is not the transportation of natural gas by interstate pipeline; *provided, however,* during the period prior to April 15, 1977, the Commission's jurisdiction to regulate the rates, charges and conditions of service for sales of natural gas for resale by such persons shall be periodically reduced, in the following manner:

“(i) During the period April 15, 1973, through April 14, 1975, sales of natural gas by each such person shall not be subject to Commission jurisdiction to the extent of twenty-five percent (25%), on a monthly basis, of the volume of natural gas not otherwise exempt under section 1(b) delivered under each contract filed as a rate schedule with the Commission.

“(ii) During each succeeding annual period following April 14, 1975, an additional twenty-five percent (25%) of total deliveries under each contract filed as a rate schedule which is not otherwise exempt under section 1(b) shall not be subject to Commission jurisdiction, in like manner and effect as provided in subsection (i). The Commission's jurisdiction shall be wholly terminated with respect to one hundred percent (100%) of such deliveries effective April 15, 1977.”

*Section 3.* Section 2(6) of the Natural Gas Act is amended by inserting before the period at the end thereof a comma and the following:

“Subject to the exemption in section 1(b) above.”

*Section 4.* Section 2 of the Natural Gas Act is amended by adding at the end thereof the following new subsections:

"(10) 'Affiliate' of another person means any person directly or indirectly controlling, controlled by, or under common control with such other person."

"(11) 'Small producer contract' means a contract for the sale of gas by the producer, gatherer or processor thereof under the terms of which the purchaser agrees to purchase a quantity not to exceed 10,000 Mcf per day averaged over annual periods; *provided, however*, that where such purchaser is a producer, gatherer or processor whose principal business is not the transportation of natural gas by interstate pipeline, resales by such purchaser attributable to gas purchases made under such small producer contracts shall be deemed also to have been made under small producer contracts. All contracts of a producer and of any person who controls, is controlled by, or is under common control with such producer covering the sale of gas from a single field shall be considered to be one contract for the purposes of this definition.

*Section 5.* Section 4(e) of the Natural Gas Act is amended by inserting at the end thereof the following:

"*Provided, however*, that the Commission shall not allow in the rates, or charges made, demanded, or received by any purchasing natural-gas company a rate for natural gas produced by an affiliate of the purchasing natural-gas company or a rate for natural gas produced from the properties of the purchasing natural gas company from wells commenced after April 15, 1973, to exceed the sales prices received by persons not affiliates of the purchasing natural-gas company;

*Section 6.* Section 5(a) of the Natural Gas Act is amended by inserting at the end thereof the following:

"*Provided, however*, that the Commission shall not allow in the rates or charges made, demanded or received by any purchasing natural-gas company a rate for natural gas produced by an affiliate of the purchasing natural gas company or a rate for natural gas produced from the properties of the purchasing natural-gas company from wells commenced after April 15, 1973, to exceed the sales prices received by persons not affiliates of the purchasing natural gas company;

"*Provided, further*, That the Commission shall have no power to order a decrease in the rate or charge made, demanded or received for the sale of natural gas by any person not engaged in the principal business of transportation of natural gas in interstate commerce, if such rate or charge shall have been previously determined to be just and reasonable, such determination being final and no longer subject to judicial review."

*Section 7.* The Natural Gas Act is amended by adding at the end thereof the following new section:

*Section 25.* During the period of reduction of the Commission's jurisdiction pursuant to section 1(d) (as amended herein), the Commission in all proceedings decided after the effective date of this Act to determine under the Natural Gas Act whether a rate schedule on file by a producer, gatherer, or processor of natural gas whose principal business is not the transportation of natural gas by interstate pipeline is just and reasonable, is required by the public convenience and necessity, and is not unduly discriminatory or preferential, shall not utilize the traditional cost of service and utility rate base method in evaluating such rate schedule, but shall take the following into account:

(a) The current and provided price of other fuels at the point of utilization, adjusted to reflect a comparable heating value;

(b) The premium nature of natural gas and its environmental superiority over other fuels;

(c) Current and projected prices for the importation of liquefied natural gas and the manufacture of synthetic gaseous fuels; and,

(d) The necessary incentives for exploration and production of domestic reserves of natural gas and the efficient end-use of such supplies."

*Section 8.* This Act may be cited as.....

Senator GRAVEL. Mr. Vaughan.

**STATEMENT OF KENNETH C. VAUGHAN, ON BEHALF OF THE GAS SUPPLY COMMITTEE; ACCOMPANIED BY THOMAS G. JOHNSON**

Mr. VAUGHAN. Thank you, Mr. Chairman.

My name is K. C. Vaughan. I am a consultant to the petroleum industry and prior to November 1, 1972, I was president of the Union Oil and Gas Division of the Union Oil Co. of California, a senior vice president of that corporation, and a director and member of the executive committee. My experience is briefly summarized in an appendix to my statement.

As indicated by Mr. Hammond, I am appearing today on behalf of the Gas Supply Committee.

I intend to discuss certain basic economic relationships in the producing industry and to describe, from the viewpoint of a major natural gas producer, the manner in which investment decisions to undertake exploration and development projects are made, and the factors which go into such decisions. I will also give my views as to the reasons for the current natural gas shortage, and discuss various alternative ways which have been suggested to alleviate that shortage.

A basic economic relationship in the producing industry which prevents a direct correlation between input of capital and output of production pertains to the substantial lead time between the decision made to explore for natural gas and the availability of such gas for sale.

Geological and geophysical reconnaissance, land or lease acquisition, exploratory drilling, development drilling, and installation of facilities for production all require time periods running from 1 to 10 years. Additional logistic time is required in remote areas. Governmental delays resulting from environmental impact statements and hearings, Federal Power Commission regulatory requirements, court challenges, licenses, permits, and contract negotiations all add to the time element.

Considering all of the above time factors, a period of 3 to 5 years from initiation to production is considered optimistic.

Now, turning to risk in the oil and gas exploration. Risk differentiates the oil and gas industry from most other industries because oil and gas exploration is exposed to a more severe risk environment. Few, if any, other industries must face the comparable risk of complete loss occasioned by the drilling of dry holes.

Exploratory risk is increasing. In 1946 1 well in every 31 new field wildcats drilled made a significant discovery. In 1966 only 1 well in 66 new field wildcats made such a significant discovery. Oil companies will continue to commit capital to the exploratory effort, but will restrict selection to those projects which in their experienced judgment have profit potential commensurate with the risk involved.

Natural gas price regulation, therefore, has limited and is limiting the number of wells being drilled.

The present positive reaction of the oil industry to increased oil prices, to recognition of the need for higher interstate gas prices by the Federal Power Commission, and to the incentive provided by

recent higher prices for gas in the intrastate free market is illustrative. This provides a concrete answer to those critics, who have alleged that supply is not responsive to increased incentives. There has been an upsurge in drilling activity starting in late 1973 and continuing into 1974. Drilling activity in December 1973 reached the highest level since 1965. Stripper wells are being returned to production and work-over of existing wells undertaken. Secondary and tertiary recovery projects are being accelerated, and without exception oil companies are announcing plans for substantially increased capital spending.

A most serious problem facing the natural gas industry is that of capital requirements. Demand for additional energy supplies will continue to grow, and if we are to prevent a serious deterioration in our self-sufficiency, much additional oil and gas must be found and developed within the United States. This can only be accomplished by a marked reversal of past efforts and adoption of an aggressive all-out exploratory program. The capital to initiate and sustain such a program will be much larger than in the past and may very well reach a staggering total. Three factors compound the problem.

Oil and gas found per dollar of expenditure has declined historically and can be expected to further decline with time. Two, the search for new supplies will be costly and will need to be conducted in more hostile environments and at greater average depths and will include more exacting environmental and safety requirements. And three, further inflation can be anticipated.

As a result of these factors, the capital requirements for the oil and gas industry are enormous. These requirements are detailed in the testimony of Mr. Kenneth E. Hill, executive vice president and head of the energy division of the Investment Banking Department of Blyth, Eastman Dillon & Co., Inc., a New York City investment banking firm. We have requested that Mr. Hill's testimony be filed with this committee.\* He points out that over a 10-year period, 1962 to 1971, the annual rate of expenditures for exploration and development has averaged about \$4.5 billion. During the same period there have been inflationary cost increases in drilling and equipping wells, total drilling has decreased nearly 50 percent, and the finding rate has steadily declined, so that the rate of expenditure has fallen progressively behind the capital investment needed to replace and enlarge our indigenous reserves of oil and gas. Since consumption steadily increased during this period, our self-sufficiency deteriorated to the point where we have been forced to rely upon imports of oil and gas to meet all new demand increments.

In Mr. Hill's opinion, one of the greatest sources of misunderstanding with respect to the petroleum industry is the confusion over the level of profits as compared with profitability or return on invested capital.

In his opinion, capital funds from within the industry are inadequate, profitability on investment remains low despite recently higher profit levels, and return on capital is below the average for manufacturing in general. Mr. Hill asserts that the required enormous investments to meet growing energy demands can be forthcoming only if dramatically improved earnings are achieved by the petroleum industry and the rate of return, no matter how measured, rises to a level greater than that of all industry in the United States.

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\*See page 1293.

Mr. Hill's opinions are supported and supplemented by the latest report from the energy division of the Chase Manhattan Bank. The bank's Mr. John G. Winger maintains that in terms of the world's current and future needs for petroleum the industry's earnings, which have averaged 59 percent more for the first 9 months of 1973 than during the same period in 1972, are still subnormal rather than excessive. This conclusion results from the bank's study of a 30-company group whose experience closely parallels the industry as a whole.

Based on this study the financial needs of the petroleum industry between 1970 and 1985 are expected to amount to over 1½ trillion dollars, and there is no current or historical evidence to suggest that the industry can achieve its required goal for any less. Estimating the amount of money prudent management can be expected to borrow and the maximum amount of capital recovery, primarily depreciation, currently permitted by law, the bank determined the industry's dependence on profits as a source of capital in 1970 to 1985 would be some \$755 billion. To reach the required level in 1974, profits of the 30 companies covered by the study would have to increase 30 percent over the level expected in 1973.

A key factor influencing increased exploratory activity is that of profitability. Allowing free market forces to operate will provide a much needed increase in revenue from flowing gas. Such additional revenue provided within the limitations of existing contracts will immediately provide much needed capital to increase exploratory drilling for new gas. The expectation of higher prices for new gas and confidence in the sanctity of the sales contract will act as an effective catalyst.

By any objective standard the rate of return earned by the oil industry is modest, particularly in relation to risk. Rate of return on net worth or shareholders' equity for the petroleum industry average 11.8 percent for the 10-year period, 1963 to 1972, as compared to 12.2 percent for the total manufacturing industry, these statistics from the First National City Bank. Further, such returns usually overstate the industry's current profitability because they fail to differentiate between old and new investments, a factor in the petroleum industry where old long-life investments influence the return.

Serious doubts have been raised by many financial experts as to the ability of the petroleum industry to obtain capital in the unprecedented amounts required. It thus appears that the best solution to the dilemma is a return to a free market that will allow prices to seek competitive levels. The higher profits levels resulting will make capital available for an expanded exploratory effort. Without such capital and without an expanded effort to find and develop domestic reserves, imports must increase materially, with serious economic side effects. In the short term there is no realistic substitute for the development of domestic natural gas reserves.

And now as to the manner in which investment decisions are made. When investment opportunities are presented to management for approval, they are carefully reviewed as to profitability, as to risk and as to the availability of capital to undertake them. Although many tools have been developed by management to aid in selecting the most attractive projects, they all have one common feature in that they seek a common relationship between investment today and in-

come in the future expressed as a rate of return. Such rate of return is not the only criteria used in decisionmaking. It is used as a screening function in rejecting certain proposed projects and if the project remains viable after such screening, other judgment factors are still applied. There is no single acceptable rate of return. An acceptable rate will vary with the type of project, with time and with circumstances.

In discussing alternative opportunities for investment, it must be kept in mind that an oil and gas producer has basically an organization which by training, experience, research, and geographical orientation is structured to direct its main activities to the exploration for and development of oil and gas. To do otherwise would invite eventual liquidation. This fact is a strong influence toward making decisions which will utilize profitably this employee experience and overall expertise. If investments in natural gas exploration are comparable in terms of risk and return with other investments which might not related to the ordinary sphere of the company's activities, it is almost certain that the decision will be made to invest in the natural gas area. Revenues from increased prices will make exploration and development more attractive as compared to alternative opportunities.

To challenge that increased prices would lead to increased exploration assumes that the industry would not act in a rational manner. The pent-up desire of the oil industry to increase exploration and development is best illustrated by the severe competition evident in recent Federal offshore lease sales and the recent announcements by many companies that capital spending is being materially increased.

And now, turning to the effect of tax policies. Another basic factor in investment decisionmaking by oil and gas producers is the tax policies applied by various Government agencies to their activities. Taxes to a corporation represent another element of cost. They are normally passed on to the consumer just as other costs such as labor and material. The total tax burden of the oil and gas industry, including local taxes, ad valorem taxes and so forth is greater than the comparable burden on other industries. This fact is usually overlooked when critics point to only the Federal income tax where oil and gas companies, because of the depletion allowance, pay less.

Taxes should not be looked at alone, but together with prices, profits, and return on investment. When this is done and comparison made with returns of other industries, it is immediately obvious that one or both of two events has taken place. The oil and gas companies have either used up the depletion allowance tax benefit in drilling more wells or they have flowed through to the consumer, through lower priced products, the equivalent of such tax savings. In my opinion, both events have probably taken place, as could be expected in a highly competitive industry. The record is clear that such depletion tax advantage has not resulted in excess profits.

I strongly believe that the percentage depletion allowance encourages the drilling of exploratory wells financed both by the industry and by outside investors. Investment tax credit provides a similar stimulus to investors in all industries.

Next, to the question as to the competitive nature of the gas-producing industry. It is my firm belief that the petroleum industry is strongly and effectively competitive. I have been associated with the petroleum industry for over 40 years, directly serving in almost

every phase of exploration and production activity, including that of president of the Oil and Gas Division of Union Oil Co. of California. In addition, for a period of 9 years I was an active participant in planning and decisionmaking as corporate senior vice president, member of the executive committee, and a member of the board of directors.

During this period of time there were no instances of collusion or monopolistic activities. On the contrary, competition was so intense as to border on the extreme. Our company was never in a position to dominate other competing companies, and conversely, there were no instances where the action of others affected our independence.

Such joint ventures and units are, in my opinion, very much in the public interest and are not evidence of anticompetitive behavior. That they result in producing oil that would otherwise be economically unrecoverable is beyond dispute. Producing or transporting products at lower cost allows companies to enhance their competitive position in the marketplace to the advantage of the consumers. It should be emphasized that in all instances each participant in a joint venture or unit retains its right to receive its share of oil and gas with the unfettered right to market such share at the price and to the buyer of its choice.

I turn now to the proposal to create a Federal corporation to explore for oil and gas. A number of the industry critics have taken the position that the best solution to the shortage is to require more Government participation, intervention, and regulation in the gas-producing business. Specifically, these critics have suggested the formation of a Federal corporation to explore for oil and gas on Federal lands.

I believe this proposal is unsound, and if adopted would be a deterrent, not an asset, to the more rapid development of domestic oil and gas resources. Further, I think such a proposal, if implemented, would almost certainly result in higher costs to consumers.

The oil and gas industry in the United States is recognized as the best in the world, with extensive accumulated experience and knowledgeable professional staffs of research scientists, geologists, geophysicists and petroleum, reservoir, production, specialized operating and construction engineers, together with experienced supervision and management.

Such organizations have been developed to their present point of efficiency over many decades. To duplicate such organizations, even in part, through the creation of a Government corporation, would require a minimum of 5 to 10 years. And to this organizational period must be added the usual delay time of 3 to 5 years. It would be the height of folly to believe that such Government corporation can or will contribute anything material to the present critical energy shortage.

The proposal to extend Federal jurisdiction to the intrastate market will not help the interstate market. If the purpose of such extension is an attempt to make an interstate buyer of natural gas competitive with the intrastate buyer, it is self-defeating and ignores the lesson of the past.

Reallocating the present limited gas supply provides no answers. What is needed is new supply. Our economic system is complex and interrelated, and business decisions made to locate plants in specific areas because of adequacy of raw material, favorable transportation,

attractive local taxation and so forth, are made after careful overall economic consideration of all such factors.

To inject restrictive regulation into local economies by controlling one or more of such essential factors could be traumatic. The current shortage in available domestic supply is not a result of inadequacy of potential supply, but of inadequate incentives to the industry coupled with accelerated demand.

Deregulation will make it possible for interstate buyers to once again compete with the intrastate buyers. They will be able to offer comparable and competitive terms and assure sanctity of contract. Where existing facilities are not being used to capacity, there is an increment of value to the pipeline to obtain sufficient volumes of gas to improve load factor. Failure to do so will increase unit costs to consumers.

The fact that major transmission lines are entering into contracts for LNG, building SNG plants and advancing large sums of capital for exploration in the Canadian Arctic 3,000 miles from Chicago to obtain gas that will have a delivered cost in excess of \$1 per Mcf suggests that they will be in a very competitive position in the purchase of domestic gas.

The ultimate solution to the national problem lies in balancing supply and demand. Expansion of Federal regulation cannot aid in this solution. This can only be accomplished by allowing free market forces to operate. Under such conditions both interstate and intrastate market demands will be met at some price level more nearly reflecting the competitive market value of gas in relation to other fuels and nuclear generated power.

If it were possible to substitute the Federal Power Commission for the efficient integrating machine of the free intrastate market, regulation would still fall short of providing a supply-demand balance because of interminable time delays. Free market forces react daily and constantly, action that cannot be duplicated by any regulatory process.

Now, as to the advantages of domestic gas supplies. The present shortage of available supplies is not indicative of a shortage of natural gas resource potential as indicated by the latest estimate of the Potential Gas Committee sponsored by the Potential Gas Agency, Mineral Resources Institute, Colorado School of Mines Foundation, Inc. The deregulation of natural gas will provide maximum incentive for the industry to explore for and develop such potential reserves, and at a price below that of liquified natural gas, synthetic or substitute gas derived from coal gasification, oil reforming or liquified petroleum gas.

There are many advantages of domestic natural gas supplies. It is my considered opinion that supplies made available through increased domestic exploration and production would be far cheaper than any alternative imported supplies. Security will be maximized.

One has only to review the current boycott by the Arab producing nations, and the doubling of prices in a period of a few months, to put this serious problem in a proper perspective. Labor, business and the consuming public will enjoy many economic side effects. Capital will be invested at home and the balance of payments improved. A free market and higher oil and gas prices will extend the productive life of marginal fields and increase ultimate recoverable reserves.



In the short term, unfortunately, we have no choice but to accept the risk of undue reliance on foreign supplies. But we should take immediate steps to alleviate the long-term problem through the development of our potential oil and gas reserves, our large coal reserves, our large shale reserves, and our nuclear generating potential.

In conclusion, it is, in my opinion, incontrovertible that our American free enterprise system is second to none. We have enjoyed a standard of living unsurpassed in the world. The contribution of the energy companies to this affluence is recognized by most economists.

Now we are faced with a short-term energy shortage. Given time, our vast potential resources can be developed and the long-term problem can be solved. It is late, but time may still be available.

A strong effort should immediately be made to free our efficient, poised, and experienced companies which comprise the Nation's energy industry, so that we can start to correct a problem that will be with us for several years. Nothing could be more in the public interest. To take such action will insure that necessary oil and gas products will be made available in time at the lowest competitive price consistent with a viable industry and the price of alternatives.

We can no longer afford to experiment with new or additional regulations, nor with an inefficient replacement for our free enterprise system, and we no longer can delay adoption of a national energy policy that is consistent, objective, and dedicated to long-term solutions, not political expediency.

Between now and 1985, the Nation's requirements for all sources of energy will increase materially. Among these sources, natural gas ranks as a premium form of energy for residential, commercial and industrial use. Its use in combating air pollution is well recognized.

Natural gas in the past has been selling at bargain prices. It would be unfortunate indeed if, for want of a competitive price, millions of consumers were denied the kind of energy they want, need, and are willing to pay for. It would be very much in the public interest to make such gas available.

S. 2806, insofar as it deals with deregulation of new and rededicated gas reserves, will accomplish the objectives which I have discussed. It is superior to the administration bill, S. 2048, in that the uncertainty occasioned by the retention of jurisdiction in the Secretary of Interior to monitor future gas prices is removed.

Although there are considerable disadvantages to the retention of Federal Power Commission jurisdiction over existing gas sales, these are alleviated to some degree by the prohibition against reductions in rates after once having received the final approval of the Federal Power Commission. This provides an element of contract sanctity which is lacking in the current law.

I must note, however, that the continuation of regulation over existing gas sales will continue to prevent the maximum effort which is needed in domestic exploration of gas. Depriving those producers who are in the best position to effectively undertake this exploration of the immediate capital needed to do the job is a serious deterrent. The incentive provided by the deregulation of new gas provides future capital, but what is most needed is maximum effort now.

S. 2806 does go a long way toward correcting the basic cause of the current gas shortage, which is in turn a root cause of the broader energy shortage. While in my opinion it does not go far enough, it

would provide a considerably better governmental atmosphere for increasing domestic gas supplies than the existing law.

Thank you, Mr. Chairman.

[Mr. Vaughan's prepared statement and a statement of Mr. Kenneth Hill, referred to previously, follows: Hearing continues on p. 1298.]

PREPARED STATEMENT OF K. C. VAUGHAN ON BEHALF OF THE GAS SUPPLY COMMITTEE

My name is K. C. Vaughan, 4414 Montrose Boulevard, Houston, Texas. I am a consultant to the petroleum industry and, prior to November 1, 1972, I was President of the Union Oil and Gas Division of Union Oil Company of California, a Senior Vice President of the corporation, and a Director and a member of the Executive Committee. My experience is briefly summarized in an Appendix to my Statement. I am appearing on behalf of the Gas Supply Committee.

I intend to discuss certain basic economic relationships in the producing industry and to describe, from the viewpoint of a major natural gas producer, the manner in which investment decisions to undertake exploration and development projects are made and the factors which go into such decisions. I will also give my views as to the reasons for the current natural gas shortage, and discuss various alternative ways which have been suggested to alleviate that shortage.

1. LEAD TIME BETWEEN INVESTMENT DECISION AND PRODUCTION

I would like first to emphasize a basic economic relationship in the producing industry which prevents a direct correlation between input of capital and output of production, and creates confusion in the minds of many. This is the fact that there is a substantial "lead time" between the time a decision is made to explore for gas in a certain area and the time that the gas is available for sale.

Long lead times are characteristic of the oil and gas industry. Because the oil and gas must first be located it is impossible to structure a "turn key" project that will be completed within a given time period and at a given cost to produce a given amount of product.

Normally, a prudent operator will consume from one to three years in preliminary geological and geophysical reconnaissance to locate and evaluate attractive prospects in order to reduce the risk factor as much as possible.

Land or lease acquisition may precede or follow geological and geophysical reconnaissance and may also require from one to three years. Acquisition of some large lease blocks may require a much longer period of time.

Onshore drilling time may vary from 30 days to 1½ years. The trend has been toward deeper wells and exploration in more remote areas where logistic time must be added to drilling time. Some wells are now being drilled to depths of over five miles and require in excess of a year to complete. Offshore drilling time will vary with rig availability. Assuming such availability, a deep test within an existing field may be drilled in as little as six months. New field wildcats, however, in greater depths of water and in remote areas may require one to two years. A discovery onshore or offshore usually requires one or more confirmation wells to assist in delineating field size and reserves. Such follow-up wells require less time but can still require 6 to 18 months.

Once a commercial reserve is indicated, complete development may take from two to ten years. Some production onshore can start early (six months to two years) depending on proximity to pipelines. If offshore, the construction of platforms and pipeline extensions or construction of new lines will require two to three years for any initial production.

Governmental delays resulting from environmental impact statements and hearings, FPC regulatory requirements, court challenges, licenses, permits and contract negotiations can seriously add to the time element. No offshore leasing has taken place in California since 1969 even though preliminary geological and geophysical work was completed long ago. The Alaskan pipeline is still years away even though Prudhoe Bay was discovered in 1968. Although geophysical work has been conducted for over five years, leasing offshore in the Atlantic has not started.

Considering all of the above time factors, a period of 3 to 5 years from initiation to production is considered optimistic. Such long lead times emphasize the importance of immediate action if we are to ameliorate the present natural gas shortage.

## 2. RISK IN OIL AND GAS EXPLORATION

A second basic economic relationship concerns the risk factor in exploration and production, a factor that differentiates the oil and gas industry from most other industries, particularly as to the degree of risk.

Risk in the business world can best be defined as the possibility of loss. It may be complete loss, partial loss, or a return on investment below estimate. Risk is present in varying degrees in almost all industries. It is an expression of all the uncertainty that surrounds the analyst's estimate of project profitability. Risk stems from many sources. Complete information is not always available. Forecasts may be uncertain. Undue material or labor delay may be disastrous. Unusual weather conditions may contribute. Finally, there is the unlimited combination of ways in which men and machines can fail to perform as predicted.

Oil and gas exploration is exposed to a more severe risk environment. Although exploration technology has made substantial progress, such progress has been primarily in the area of refinement in tools and in interpretation techniques. As yet, no direct oil or gas finding tool exists except the drill. This means that at some point in the overall project consideration a decision must be made by management to accept the risk of complete failure and to spend large sums of money to drill a well which may be dry. Few, if any, other industries have a comparable risk of complete failure.

It has been common practice for the layman to assume that 10%, or one exploration well out of ten drilled, is successful. To management this is a poor economic indicator and valueless in the assessment of the true project risk. A much better indicator or guide is the estimated ultimate reserves in the fields found related to the number of exploratory wells drilled. This can best be illustrated by reference to the annual report of the American Association of Petroleum Geologists (AAPG) on drilling activity in 1972.<sup>1</sup> This report indicates that during 1972, 7,539 exploratory wells were drilled in the United States as compared to 6,922 wells in 1971. It must be emphasized, however, that the 1971 and 1972 total exploratory wells are the fewest such wells drilled since 1947. Exploratory wells are subdivided into five categories by the AAPG and American Petroleum Institute (API) (see Chart 1 contained in Appendix B to my statement). Number of exploratory wells drilled and percentage in each class are presented as a five-year history (Table 1).

The initial estimate of the ultimate recovery to be expected from a new field discovery provides a good evaluation of risk. Such information is shown as a sub-total (A + B + C + D) in Table 2. This early estimate of a field's potential is somewhat speculative and should not be compared with a calculation of proven reserves using strict reservoir engineering guidelines. Used with care by experienced management, however, the information has value.

The best assessment of the risk factor is an evaluation of the number of new-field wildcats required to find one significant field. "Significant" is defined as a field with ultimate recovery greater than one million barrels of oil or six billion cubic feet of gas. Such new-field wildcats encounter the highest risk but offer the greatest potential for discovery of large reserves. The trend is unmistakable, requiring 31 wells per significant discovery in 1946 and about 66 wells per significant discovery in 1966 (Chart 2). (Data for 1966 is the latest reported as of 1972 because of the necessity to allow time for field delineation. AAPG uses six years after discovery as a reasonable time for field reserves evaluation.) It should be emphasized that to be profitable a field capable of producing one million barrels, or six billion cubic feet (at the lower range of the significant scale), would need to be located onshore, shallow depth, close to market and produce good quality products.

The compilation by the AAPG of total industry statistics does not, of course, reflect the experience of a particular company. Average include the experience of bankrupt companies as well as the most successful company, but the industry statistics can and should provide guidance on a national basis. Such statistics must be used properly and carefully. It is important to remember, however, that alleviation of the present energy shortage lies in an all-out exploration and drilling effort by the entire industry, including newcomers.

The same economic laws apply to the drilling of exploratory wells as to all other businesses. Oil companies will continue to commit capital to the exploratory effort but restrict selection to those projects which in their experienced judgment

<sup>1</sup> The American Association of Petroleum Geologists Bulletin, Volume 57/8 . . . August 1973.

have profit potential commensurate with the risk involved. This is what took place when regulated natural gas prices resulted in an insufficient number of wells being drilled.

The present positive reaction of the oil industry to increased oil prices, to recognition of the need for higher interstate gas prices by the F.P.C., and to the incentive provided by higher prices for gas in the intrastate free market is illustrative. This provides a concrete answer to those critics who have alleged that supply is not responsive to increased incentives. There has been an upsurge in drilling activity starting in late 1973 and continuing into 1974. Stripper wells are being returned to production and work over of existing wells undertaken. Secondary and tertiary recovery projects are being accelerated. And without exception oil companies are announcing plans for substantially increased capital spending.

### 3. CAPITAL REQUIREMENTS

The third basic economic relationship which must be considered is the amount of capital required to explore for and develop oil and gas in this country. If the exploration effort is to expand materially, tremendous sums must be available for that purpose.

The United States is currently deficient in regard to domestic supplies of oil and gas to meet current demands. The demand will continue to grow and if we are to prevent serious deterioration in our self-sufficiency much additional oil and gas must be found and developed within the United States. This can be accomplished only by a marked reversal of past efforts and adoption of an aggressive exploratory program. The capital to initiate and sustain such a program will be much larger than in the past. Oil and gas found per dollar of expenditure has declined historically and can be expected to further decline with time. The search for new supplies will be costly and will need to be conducted in more hostile environments and at greater average depths and will include more exacting environmental and safety requirements.

The petroleum industry has been severely restricted in its ability to generate the capital funds required to finance an exploratory program of the magnitude required to keep pace with the nation's rapidly expanding needs. Regulatory prescription of natural gas prices at levels below those established by a free market produced an imbalance in the overall energy market. Coal and oil could not compete in some instances, development of alternative energy sources was delayed, refineries were tailored for minimum fuel oil output, capital generation was slowed and the seeds were planted for a future shortage. Irrespective of the restrictions and resulting problems, however, the industry continued to explore for and develop oil and gas, drilling a total of 653,000 wells in the 15-year period 1955-1970 and expending \$68 billion.

The enormous scale of the capital requirements of the oil and gas industry are detailed in the testimony of Mr. Kenneth E. Hill, which has been requested to be filed with this Subcommittee. Mr. Hill is Executive Vice President and head of the Energy Division of the Investment Banking Department of Blyth, Eastman Dillon & Co. Incorporated, a New York City investment banking firm. He points out that the inability of the domestic petroleum industry to finance an adequate search for oil and gas commensurate with the rising demands for their products has been apparent for at least 10 years. Over the 10-year period, 1962-1971, the annual rate of expenditures for exploration and development has averaged about \$4.5 billion. During the same period there have been inflationary cost increases in drilling and equipping wells, total drilling has decreased nearly 50 percent, and the finding rate has steadily declined, so that the rate of expenditure has fallen progressively behind the capital investment needed to replace and enlarge our indigenous reserves of oil and gas. Since consumption steadily increased during this period, our self-sufficiency deteriorated to the point where we have been forced to rely upon imports of oil and gas to meet all new demand increments.

In Mr. Hill's opinion one of the greatest sources of misunderstanding with respect to the petroleum industry is the confusion over the level of profits as compared with profitability or return on invested capital. He cites the criticism of the press and some observers leveled against the industry because of the simultaneous occurrence of record levels of profit and shortages of petroleum products. The intuitive deduction by many unfamiliar with the industry is that with the higher levels of profits the necessary funds for expansion of supply must surely be available. And some of the industry critics appear to believe that profits are excessive. In Mr. Hill's opinion, none of these conclusions are correct; capital funds from within the industry are inadequate, profitability on investment

remains low despite recently higher profit levels, and return on capital is below the average for manufacturing in general. Mr. Hill asserts that the required enormous investments to meet growing energy demands can be forthcoming only if dramatically improved earnings are achieved by the petroleum industry and the rate of return, no matter how measured, rises to a level greater than that of all industry in the United States.

Mr. Hill's opinions are supported and supplemented by the latest report from the Energy Division of the Chase Manhattan Bank. The bank's energy expert, John G. Winger, maintains that in terms of the world's current and future needs for petroleum the industry's earnings (which have averaged 59 percent more for the first 9 months of 1973 than during the same period in 1972) are still subnormal rather than excessive. This conclusion results from the bank's study of a 30-company group whose experience closely parallels the industry as a whole. Based on this study the financial needs of the petroleum industry between 1970 and 1985 are expected to amount to over 1½ trillion dollars and there is no current or historical evidence to suggest that the industry can achieve its required goal for any less. Estimating the amount of money prudent management can be expected to borrow and the maximum amount of capital recovery (primarily depreciation) currently permitted by law, the bank determined the industry's dependence on profits in 1970 to 1985 would be \$755 billion. To reach the required level in 1974, profits of the 30 companies covered by the study would have to increase 30 percent over the level expected in 1973. Mr. Winger has this to say, "There is no realistic basis for thinking that an adequate supply of energy can be had without paying the full costs. The supply of energy, any form of energy, is related directly to the expenditures made to provide that energy. It's that simple. The energy industries can't invest enough if the money isn't available. And the money won't be available if profits aren't adequate."

#### 4. INDUSTRY PROFITABILITY

The fourth major economic relationship I would like to discuss is the function of profit in generating and attracting the capital which will be required. I will also discuss the term "windfall profit" which I believe is an inaccurate and misleading characterization of the earnings which will be required by the industry to meet its capital requirements.

If the petroleum industry is to reduce the nation's reliance upon foreign imports of crude oil and natural gas in the period 1971 to 1985, we have already noted that capital investment will need to be doubled. Because of the relatively high risk in exploration, the industry has historically depended for reinvestment upon funds generated from operations. Such funds consist of net earnings plus various provisions for capital recovery, primarily depreciation. Even assuming maximum desirable debt equity ratios in the future, it is obvious that projected capital needs cannot be met without materially increased earnings. By any objective standard the rate of return earned by the oil industry is modest particularly in relation to risk. Rate of return on net worth or shareholders' equity for the petroleum industry averaged 11.8% for the ten-year period, 1963-1972, as compared to 12.2% for the total manufacturing industry (First National City Bank, Monthly Letter, April 1972). Further, such returns usually overstate the industry's current profitability because they fail to differentiate between old and new investments, a factor in the petroleum industry where old long-life investments influence the return.

Serious doubts have been raised by many financial experts as to the ability of the petroleum industry to obtain capital in the unprecedented amounts required. It thus appears that the best solution to the dilemma is a return to a free market that will allow prices to seek competitive levels. The higher profit levels resulting will make capital available for an expanded exploratory effort. Without such capital and without an expanded effort to find and develop domestic reserves, imports must increase materially, with serious economic side effects. In the short term there is no realistic substitute for the development of domestic natural gas reserves.

It has been argued that allowing the field price of gas to increase will result in a windfall to many producers. The word "windfall" has been used dramatically many times in hearings before the FPC, in House and Senate committee hearings, in legal briefs and in court proceedings. Such use was designed to connote unjust unreasonable or undeserved revenue and profits. In my opinion, the use is improper. Webster defines the word "windfall" as "an unexpected sudden gain or advantage." This does not fit the exploration and production segment of the oil

industry where high returns or profits from *some* fields are fully expected, as are complete losses resulting from dry holes. Without such occasional success the industry could not absorb serious or complete losses on many exploratory ventures. This situation does not differ radically from other business ventures. The farmer who grows corn on rich, high-yield river bottom soil could be accused of windfall profits in comparison to the farmer who tills less fertile, less productive land with marginal profits. Yet both farmers are needed if supply is to meet demand.

The use of the word "windfall" is also improper in my opinion when related to the increased profits resulting from the deregulation of flowing gas.<sup>2</sup> Some persons argue that capital has already been invested and that profit levels being realized are adequate under regulation. We have already pointed out that the return on equity for the oil industry is less than the average of all manufacturing industries. We have also emphasized future capital requirements and the need for internal generation of such capital. Allowing flowing gas prices to rise in accordance with contract terms would be recognition that past prices have been too low to elicit necessary supplies. Even though such increases would be modest because of existing contract restrictions, allowing such contracts to operate in accordance with their terms would go far in restoring the confidence of the industry that has been seriously eroded. I cannot overemphasize the importance of confidence. The industry has shown its willingness to accept the high risk inherent in the business but no prudent businessman would accept the additional risk that if he is successful in his exploration efforts his contract for the sale of his products negotiated in good faith will not be honored.

The use of the word "windfall" as it relates to the independent producer is even further off base. The sole assets of the independent are contained in his proven reserves and his profits and cash flow are generated by the production of those reserves. Whereas the financial flywheel of a major integrated oil company provides some flexibility in borrowing against total assets, the independent is confined to the value of his reserves. It is highly doubtful that he would pledge such reserves as collateral against the drilling of a high risk exploratory well. If he is to be encouraged to continue exploration, he must receive from the sale of his product sufficient profit, which includes depletion allowance, and cash flow to pay for an exploratory effort that will be far more costly on a unit basis than his past efforts. The independent producer has contributed materially in the past to the nation's search for oil and gas reserves and his help is badly needed again.

In my opinion, the only proper use of the word "windfall" pertains to the fortunate user of natural gas who, sheltered by regulation, continues to enjoy a true windfall in comparison to the unfortunate user of natural gas who can not obtain service or who will be forced to pay higher prices for alternate fuels.

It is true that total profits of producers have increased but not in proportion to investment. Increased returns and profits will create an economic climate that will encourage greater risk taking through the drilling of a large number of additional wells. For example, recent increases in industry profitability have already caused drilling activity to reach the highest level since, 1965, in the month of December 1973. This is the only way that supply and demand can eventually balance.

##### 5. INVESTMENT DECISION MAKING

The charge is made that if gas prices are deregulated, or if gas prices are otherwise permitted to be increased by the Federal Power Commission, there is no assurance that the gas producers will reinvest the additional revenues in gas exploration. In response to that charge I would like to discuss the manner in which investment decisions are made by one major gas producer, which experience I believe to be typical of major producers in general. In this discussion I will point out that the price anticipated to be received for the products which are hoped to be found as a result of the exploratory expenditures being considered bears a very definite relation to the decision whether or not to engage in the activity.

Before investment decisions are considered on specific projects, a corporate long-range plan is adopted. Such plan recognizes the function of short-term or action planning and budgeting but goes much further by emphasizing evaluation of the impact of future business environmental change on current decisions. This long-range plan, then, provides management with the guidelines or parameters within which individual investment decisions are made. The plan is considered as

<sup>2</sup> Flowing gas is defined as that gas produced and sold from wells presently in existence.

a blueprint for the future based on conditions as they are known and foreseen today. It is, of course, necessary to frequently revise and update it.

Top management is directly involved in structuring such a long-range plan that is built within the confines of the total economic environment with full consideration of such factors as the projected areas where operations and efforts will be concentrated, diversification possibilities, projected capital expenditure requirements and methods of financing. Within such a framework it is then possible to project within reasonable tolerance the long-term consequences on the entire company of various major decisions being considered by any division of the company. The corporate plan is the end result of an effort to select that combination of decisions which, in the light of available knowledge, has a high probability of producing the best long-term results for a company as a whole. Once such a plan is accepted it serves as a guide for each operating division where most of the investment opportunities considered are initiated and analyzed.

When investment opportunities are presented to management for approval they are carefully reviewed as to profitability, as to risk and as to the availability of capital to undertake them. Although many tools have been developed by management to aid in selecting the most attractive projects, they all have one common feature in that they seek a common relationship between investment today and income in the future expressed as a rate of return. Project profitability is estimated by normally utilizing a discounted cash flow rate of return analysis. The discounted cash flow rate of return is a method of measuring the earning power of a project and expressing it as an average annual rate of return on investment. Such a rate of return means that the project will earn that rate for each year on the cash in the project and, in addition, eventually recover all costs. Such rate of return is not the only criterion used in decision making. It is used as a screening function in rejecting certain proposed projects and if the project remains viable after such screening, other judgment factors are still applied.

There is no single acceptable rate of return. An acceptable rate will vary with the type of project, with time and with circumstances. Before approving a specific project, the risk involved and the company's resources are weighed. The factor of risk has been previously discussed and the greater the anticipated risk, the higher the required rate of return. In natural gas exploration the return must be high to compensate for inherent risk. Money cannot be raised for exploration alone. Banks or financial institutions are unwilling to loan money for an exploratory well when the only collateral for the loan would be the well production, if successful. Accordingly, a company issuing debt capital must acquire such capital on the basis of other proven assets. Once acquired, such borrowed capital admittedly loses identity in the corporate treasury, but no prudent company would allocate such funds without full recognition of both source and projected use. This is the reason the petroleum industry's reliance upon borrowed capital has been proportionately smaller than that of most other large industries.

With respect to the independent producer, the shortage of capital required for new exploration is particularly acute. Faced with higher costs, growing risks and uncertainty as to the price he may be able to obtain for his product in the event he is successful he has undoubtedly made decisions to divert his capital to other areas of investment. The result has been a significant erosion in the number of independent producers and a reduction in the exploratory activity of those remaining. Their past contribution to finding and developing our oil and gas reserves is well documented and renewed activity on their part is essential.

An important part of management decision making is to survey the other alternative opportunities for investment available to that management. In discussing alternative opportunities for investment, however, it must be kept in mind that an oil and gas producer has basically an organization which, by training, experience, research and geographical orientation, is structured to direct its main activities to the exploration for and development of oil and gas. To do otherwise would constitute eventual liquidation. This fact is a strong influence toward making decisions which will utilize profitably this employee experience and overall expertise. If investments in natural gas exploration are comparable in terms of risk and return with other investments which might not be related to the ordinary sphere of the company's activities, it is almost certain that the decision will be made to invest in the natural gas area. This fact, I believe, is best illustrated by the heavy expenditures which have been made in an economic atmosphere far from ideal. For example, over three-fourths of the wells drilled in the world were drilled in the United States in the period 1955-1970.

Any commercial or industrial enterprise—business—is essentially involved in investing money today in projects that will generate future income. Competition

and efficiency demand reasonable specialization but the range of possible investments is still broad. No business firm has an unlimited supply of money to invest at any time so that it is both essential and mandatory that management recognize their obligation to the stockholders by prudent investment in the best combination of projects available.

Within the confines of an integrated oil and gas company opportunities are legion. Money can be invested in domestic or international exploration and production, refining, liquefied petroleum gas, marketing, transportation, many facets of the petrochemical business, shale oil recovery, tar sands recovery, fuel cells, etc. Such opportunities continually present themselves to management and must compete for available funds. This means that many projects must be sacrificed in order to utilize available funds on those considered most attractive.

Revenues from increased prices will make conventional oil and gas exploration and development more attractive. It will also be more attractive than before as compared to alternative opportunities. Oil and gas companies have grown because they have developed expertise in the natural resource business over many decades. Further, the integrity of such companies is dependent upon maintaining their reserves, something that can be accomplished only through the drilling of many exploratory wells. To challenge that increased prices would lead to increased exploration assumes that the industry would not act in a rational manner.

The pent-up desire of the oil industry to increase domestic exploration and development is best illustrated by the severe competition evident in recent federal offshore lease sales. It is also apparent in the recent upsurge of activity in drilling, in the rehabilitation of old stripper wells, and in renewed secondary and tertiary recovery activities. It is equally evident in the announcements of individual companies that they plan materially to increase capital spending in 1974.

#### 6. EFFECT OF TAX POLICIES

Another basic factor in investment decision making by oil and gas producers is the tax policies applied by various government agencies to their activities. Taxes to a corporation represent another element of cost. They are normally passed on to the consumer just as other costs, such as labor and material. The total tax burden of the oil and gas industry, including taxes paid to foreign governments and the heavy burden of state and local taxes, is greater than the comparable burden on other industries. This fact is usually overlooked when critics point to only the federal income tax where oil and gas companies, because of the depletion allowance, pay less. This depletion allowance, in effect since 1926, was reduced January 1, 1970, from 27.5% to 22% and, with the compounding effect of the minimum tax, to an effective rate of less than 20%. The end result was a reduction in profits of about \$500,000,000 and came at a most inappropriate time in view of the serious need for capital to expand the exploration effort. At an assumed cost of \$125,000 per well, this loss of profits represents the drilling of 4,000 additional exploratory wells per year.

Taxes should not be looked at alone but together with prices, profits and return on investment. When this is done and a comparison made with returns of other industries it is immediately obvious that one or both of two events have taken place. The oil and gas companies have either used up the depletion allowance tax benefit in drilling more wells or they have flowed through to the consumer, through lower priced products, the equivalent of such tax savings. In my opinion, both events have probably taken place, as could be expected in a highly competitive industry. The record is clear that such depletion tax advantage has not resulted in excess profits.

I strongly believe that the percentage depletion allowance encourages the drilling of exploratory wells both by the industry and by outside investors. Investment tax credit provides a similar stimulus to investors in all industries. Whether needed profits come from incentive tax treatment or higher prices, or both, they are sorely needed by the oil and gas industry if the challenge of the energy shortage is to be met. This is not the time to attack the remaining depletion allowance. With profits of the high risk oil industry not even up to the average of all manufacturing industries, it is better a time to provide additional incentives. The side effects on economic security, the balance of payments, and the over-reliance on a foreign supply to fuel our industrial machine are well worth considering. What is sorely needed is a stable tax policy that seeks to stimulate—not thwart—domestic oil and gas discoveries.



## 7. COMPETITIVE NATURE OF THE GAS PRODUCING INDUSTRY

In October 1973, the Committee on Commerce of the Senate heard from various witnesses, some of whom contended that the gas producing industry was not effectively competitive. Based on my experience in the petroleum industry, I disagree with that thesis. It is my firm belief that the petroleum industry is strongly and effectively competitive.

I have been associated with the petroleum industry for over 40 years directly serving in almost every phase of exploration and production activity, including that of President of the Oil and Gas Division of Union Oil Company of California. In addition, for a period of nine years I was an active participant in planning and decision making as Corporate Senior Vice President, member of the Executive Committee and member of the Board of Directors. During this period of time there were no instances of collusion or monopolistic activities. On the contrary, competition was so intense as to border on the extreme. Our company was never in a position to dominate other competing companies and conversely there were no instances where the action of others affected our independence.

In the exploration phase of the industry, it is common to enter into joint ventures with other companies to conduct geophysical surveys with each company receiving basic records for individual interpretation. Most of this work is by contract and the joint venture approach is strictly an attempt to lower costs. It is not unusual for independent geophysical companies to conduct such surveys on a speculative basis and offer them to any interested buyer, including government agencies, at a cost far less than the cost related to a company survey conducted for its own use. The survey constitutes only one of many factors to be integrated into a final picture and, using the same basic survey data, companies will vary widely on both interpretation and enthusiasm.

Often, joint ventures extend to the acquisition of leases followed by joint exploratory drilling and development. Although operation economies are thus possible, the overwhelming reasons for such ventures are quite simple, particularly offshore:

(1) No single company has the capital availability to participate competitively in all exploratory projects or lease sales on a scale that allows reasonably broad exposure.

(2) A prudent company normally desires to bid aggressively on a number of tracts jointly rather than to put its available capital on one or two tracts. Experience with the inherent risk of exploration, as discussed above, dictates such approach.

The trading of electric logs or geophysical records is simply a logical way to extend the exploratory dollar which is always limited. In this case, the companies trading such records have both short- and long-term reasons for the exchange. Acquiring a well log critical to a more complete analysis is quite important. To obtain such a log requires that you give something in return, usually another confidential well log. Here again, the value placed on a given area or project varies widely between companies. One company may be happy to trade a confidential log in an area they feel is condemned to another company who feels attractive possibilities still exist. In every instance, it is recognized that trading such information will, in all probability, increase competition.

In the development and production phase it is common and desirable to enter into the unitization of fields. Usually the operator chosen is the company with largest holdings. Such units are formed in order to increase the ultimate economic recovery from the field. This can be accomplished only by treating the reservoir as a unit and conducting all operations, including the drilling of required new wells, in conformance with the outline of the producing reservoir, *not* the property lines. Before a unit is possible, equities must be agreed upon and an acceptable plan of development approved. In my opinion the petroleum industry should be complemented for taking the initiative in the unitization of producing fields.

It is also common in the industry to build joint venture pipelines for transporting both crude and finished products. Here again, justifications are obvious. One large-line rather than several small ones (if such could be justifiably built) provide economies that are definitely in the public interest. Participation is not limited and the pipelines are regulated common carriers with limitations on the rate of return. I could not envision how a pipeline could be built from the North Slope of Alaska to Valdez except as a joint venture. And when natural gas lines are built to bring Arctic gas to market, it seems certain that they too will be joint venture projects.

Such joint ventures and units are, in my opinion, very much in the public interest in that they permit the production of gas and oil that would otherwise be economically unrecoverable. Producing or transporting products at lower cost allows companies to enhance their competitive position in the market place to the advantage of the consumers. It should be emphasized that in all instances such participant in a joint venture, or unit, retains its right to receive its share of oil and gas with the unfettered right to market such share at the price and to the buyer of its choice.

Finally, the profits of the oil and gas companies (including their so-called tax advantages), in comparison with the profits of all U.S. manufacturing industries, strongly supports the conclusion that a monopoly does not exist. The inherently high risk petroleum industry had a return on net assets of 11.8% during 1962-1971 as compared to an average rate of return earned by all manufacturing industries of 12.2%.

Competition is very much at work in the petroleum industry. What is sorely needed at this crucial time is not harassment but genuine government-industry cooperation.

#### 8. FEDERAL CORPORATION TO EXPLORE FOR OIL AND GAS

While clinging to the myth that the gas shortage is a hoax, a number of the industry critics have further taken the position that if the gas shortage is real the best solution to the shortage is to require more government participation, intervention and regulation in the gas producing business. Specifically, these critics have suggested the formation of a federal corporation to explore for oil and gas on federal lands. I believe this proposal is unsound, and if adopted would be a deterrent, not an asset, to the more rapid development of domestic oil and gas resources. Further, I think such a proposal, if implemented, would almost certainly result in higher costs to consumers.

Most knowledgeable individuals in government and industry agree that the energy shortage is twofold—a current or short-term problem (three to ten years) and a long-term problem (after ten years). The long-term problem is considered less acute because of the existence of a large resource base of fossil fuels (oil, gas, coal, oil shale) and a sufficiently large resource base of uranium to support all the nuclear plants that can be built in the reasonable future (up to 30 years). Also, I have implicit faith in our technological abilities, operating in a free enterprise environment, to solve the long-term problem. The short-term problem is acute because the past warnings of impending shortages by knowledgeable energy experts went unheeded by Congress and the public. As a result, much valuable time was lost and only after our proved reserves had been seriously depleted to the point where deliverability was reduced has there been general recognition of the problem. Even now the industry is being wrongly accused of withholding production and creating the shortage for the sole purpose of increasing prices.

Even though our present energy shortage has been largely government imposed, it is now proposed that the remedy lies in the creation of a government corporation to explore for and develop oil and gas on federal lands. This would be a serious mistake for many reasons, and would serve to delay corrective action so sorely needed at this time. The oil and gas industry in the United States is recognized as the best in the world with extensive accumulated experience and knowledgeable professional staffs of research scientists, geologists, geophysicists, and petroleum, reservoir, production, specialized operating and construction engineers together with experienced supervision and management. The American oil and gas industry, which developed through free enterprises, can be compared with development in the same industry by government agencies in foreign countries, which have not enjoyed anywhere near the same degree of success. American knowledge and expertise have served as a model for the rest of the world, which still relies heavily upon their assistance. Such organizations have been developed to their present point of efficiency over many decades. To duplicate such organizations, even in part, will require a minimum of five to ten years. And to this organizational period must be added the usual time delay between lease acquisition, geological and geophysical reconnaissance, exploration, construction, development and final marketing. Such time delay is usually not less than three years and can extend to as much as seven years. It would be the height of folly to believe that such government corporation can or will contribute anything material to the present critical energy shortage.

It has also been proposed that a government corporation would provide a reliable cost base or benchmark by which to judge the proper level of gas prices. After 19 years of frustration the inadequacy of regulation, based on the rate

base cost of service method, surely needs no further documentation. To obtain meaningful unit costs from the experience of a government corporation would in itself require many years in order that a broad based sample be provided. Assuming, *arguendo*, that such costs were obtained, how would they be used? If very selective drilling were done you could expect a higher discovery ratio than normal and lower costs. If success was very poor, unit costs would be very high. This would simply parallel industry history. Some operators have either failed completely or found marginal reserves with almost infinite unit costs. On the other hand, a successful operator finding a shallow, prolific field would have very low unit costs and enjoy the so-called "windfall profits" under almost any pricing method. Use of average costs doesn't work since it is the marginal producer who fills the last element of supply to satisfy demand and his costs are well above average.

When properly analyzed, the proposal to give a government corporation an opportunity to explore for and develop reserves on federal lands is indeed insidious and misleading. It is a subtle but effective means of supporting socialization of industry. To profess a belief in the virtues of our free enterprise system while urging that a government corporation be given a "trial" is nothing more than clever deceit.

The solution to the problem of natural gas shortage is a return to free market forces and the eventual balancing of demand and supply. This can be accomplished only through intensive exploration and development of both federal and private lands and will require an aggressive industry using the full forces available and a cooperative government. Energy is the key to our economic survival and we can no longer afford the luxury of further experimentation.

#### 9. EXPANSION OF FEDERAL JURISDICTION TO INTRASTATE GAS SALES

Another suggestion made by industry critics is to expand Federal Power Commission jurisdiction to cover intrastate sales of natural gas.

Federal regulation of the interstate market has been basically unsound and a dismal failure. Those imposing utility-type control over field natural gas prices must now assume full responsibility for upsetting our complex energy market. This situation did not immediately manifest itself in the 1950's because we had sufficient reserves to insure deliverability of natural gas and some spare oil producing capacity. The disruption, however, was felt very early in the competitive fuel markets for crude oil products and in the coal markets. Also the development of energy alternatives was further delayed.

Extending federal jurisdiction to the intrastate market will not help the interstate market. If the purpose of such extension is an attempt to make the interstate buyer of natural gas competitive with the intrastate buyer it is self-defeating and ignores the lesson of the past. Reallocating the present limited gas supply provides no answers. What is needed is a new supply. Our economic system is complex and interrelated and business decisions made to locate plants in specific areas because of adequacy of raw material, labor availability, low cost fuel or water, proximity to market, favorable transportation, attractive local taxation, etc., are made after careful overall economic consideration of all such factors. To inject restrictive regulation into local economies by controlling one or more of such essential factors could be traumatic. The current shortage in available domestic supply is not a result of inadequacy of potential supply but of inadequate incentives to the industry coupled with accelerated demand.

Interstate buyers of natural gas had little or no trouble in competing with the intrastate market so long as there existed a supply of gas sufficient to fill both markets. When demand exceeded supply, gas producers chose to commit gas to the intrastate market for the simple and logical reason that they could rely upon the integrity and sanctity of their sales contracts and could pursue future financial planning with confidence. This placed the interstate buyers of natural gas in a non-competitive position. Any prudent businessman would choose the stability and integrity of the intrastate market rather than accept the risks of the interstate market. The gas producer fully understands the inherent risk in exploration and is willing to accept such risks because he can evaluate them and to some extent control them. He is understandably hesitant, however, to accept the additional risk that if he is successful in his exploration efforts he will not be allowed to rely upon all of the terms of a contract negotiated in good faith. If large amounts of capital are to be invested or reinvested in exploration and development, the producer must have confidence in his revenue producing sales contract.

Deregulation will make it possible for interstate buyers to once again compete with the intrastate buyers. They will be able to offer comparable and competitive

terms and assure sanctity of contract. Where existing facilities are not being used to capacity there is an increment of value to the pipeline to obtain sufficient volumes of gas to improve load factor. Failure to do so will increase unit costs to consumers. The fact that major transmission lines are entering into contracts for LNG, building SNG plants and advancing large sums of capital for exploration in the Canadian Arctic 3,000 miles from Chicago to obtain gas that will have a delivered cost in excess of \$1.00 per Mcf, suggests that they will be in a very competitive position in the purchase of domestic gas.

The solution to the national problem lies in balancing supply and demand. This can be accomplished only by allowing free market forces to operate. Under such conditions both interstate and intrastate market demands will be met at some price level more nearly reflecting the competitive market value of gas in relation to other fuels and nuclear generated power. End-use controls are not in the public interest. Extension of jurisdiction to the intrastate market will inevitably result in allocating, rationing and end-use controls of an inadequate supply probably by the Federal Power Commission, the same agency whose policies caused the shortages to develop.

If it were possible to substitute the Federal Power Commission for the efficient integrating machine of the free intrastate market, regulation would still fall short of providing a supply-demand balance because of interminable time delays. Free market forces react daily and constantly, action that cannot be duplicated by any regulatory process.

The serious effect of the energy shortage on the U.S. economy must be dealt with intelligently and immediately. We cannot afford the luxury of further experimentation or "trying out" ideas, such as regulation of the intrastate market, that are basically unsound. The energy problem, in the short term is approaching national emergency status and must be attacked, not approached, by a coalition of industry and government seeking both short-and long-term solutions. Extending federal regulation of natural gas to the intrastate market will *not* provide that solution. I cannot envision how extending federal regulation to the intrastate market will provide additional supply. Based on past experience, one would expect an erosion in incentive and confidence and, consequently, a reduction in the exploratory effort. The price of natural gas will significantly influence the magnitude of reserves to be found and produced, and a free market is the best way to determine a price which will achieve a supply-demand equilibrium.

#### 10. ADVANTAGES OF DOMESTIC GAS SUPPLIES

With projected high costs of alternative gas supplies every effort should be made to develop additional domestic supplies of both gas and oil. In the short term we are irrevocably locked into our present pattern of consumption, even recognizing increased conservation and more efficient usage. Additional domestic supplies will provide a welcome transition while we are adopting and pursuing a long-term solution. The present shortage of available supplies is not indicative of a shortage of natural gas resource potential. The Potential Gas Committee sponsored by the Potential Gas Agency, Mineral Resources Institute, Colorado School of Mines Foundation, Inc., estimates potential supply of gas in the United States as of December 31, 1972, to be 1,146 trillion cubic feet. It must be emphasized that this potential supply is not currently available to consumers but must be explored for, found and developed. It is over and above present proved reserves that amounted to 239 trillion cubic feet on January 1, 1973, excluding Alaska. The reliability of this estimate stems from the expertise of the topflight professional people who staffed the work committees and the standards established by the agency. Observers from state and federal government agencies attended all Potential Gas Committee meetings. Because this is not a first estimate by this group, and because it compares favorably with numerous estimates made by others, reasonable credibility must be accorded it. The deregulation of natural gas will provide maximum incentive for the industry to explore for and develop such potential reserves and, in my opinion, at a price below that of other alternatives.

There are many advantages of domestic natural gas supplies to consider. Security will be maximized. Labor, business and the consuming public will enjoy many economic side effects. Capital will be invested at home and the balance of payments improved. A free market and higher oil and gas prices will extend the productive life of marginal fields and increase ultimate recoverable reserves. Secondary and tertiary methods of recovering a greater percentage of oil in place will be encouraged. This is important because each 1% added to the present average recovery of 32% will add one billion barrels of oil to reserves.

Because we chose to ignore the clear-cut warning signs and the dire consequences of a rapidly declining reserves to production ratio and failed to take corrective action many years ago, we have seriously limited our available options. Development of our domestic sources immediately is a logical, economical approach and will help to alleviate a serious threat to our economic system. In the long term we have many options for altering or tailoring our energy consumption patterns. Higher energy costs will assure conservation and the development of more efficient usage. Nuclear plants will be firmly established. Abundant coal and oil shale reserves can be developed. And, hopefully, we will have a consistent, coherent national energy policy to follow.

Signs of the current shortage were long apparent to energy experts and economists but those who attempted to point out the approaching problems and the time necessary for corrective action were given little credibility. Also, the consuming public paid little heed because, almost without exception, their immediate energy demands were being met and at low cost.

The indirect but effective regulation of crude oil prices since 1959 and the direct regulation of natural gas since 1954 resulted in a reduction of exploratory incentive. Geophysical work was reduced and the number of exploratory wells drilled dropped from a high in 1956 of 8,742 to a low of 6,992 in 1971. Demand continued to increase while the reserves to production ratios for oil and gas declined. Finally, the breaking point arrived when deliverability dropped below demand. Currently, more oil and gas is being consumed domestically than is being found. While consumption of gas was encouraged through prices below market clearing the development of alternative energy supply from coal, shale oil, tar sands and geothermal was economically discouraged by the same low prices for gas.

Many now argue that we should develop a strong energy conservation program. However effective such conservation efforts, our energy demands will continue to increase and there is currently no substitute for greatly increased imports of both oil and gas. Danger to security of supply is very real. One has only to review the many past incidents of Eastern Hemisphere oil shipment interruptions and the current threats to put this serious problem in a proper perspective. The security issue is heavily weighted with international political implications but there are other very important issues. To rely upon oil and gas that has to be transported from 6,000 to 12,000 miles involves considerable risk. Natural gas must be liquefied at temperatures of  $-258^{\circ}$  F., transported in special tankers and received in terminal facilities designed for such low temperatures. Plant shutdown, transportation problems and domestic storage all carry inherent risk. To reduce such risk in part will require tremendous storage terminals to provide months of standby fuel. Such storage system in itself introduces risk and logistical problems.

Few people realize how completely dependent we have become upon an adequate secure fuel supply. In the short term we have no choice but to accept the risk of undue reliance on foreign supplies but we should take immediate steps to alleviate the long-term problem through the development of our potential oil and gas reserves, our large coal reserves, our large shale reserves and our nuclear generating potential. Energy experts recognize the incredible amount of work to be done. The legacy of past restrictive policies will remain for many years.

## 12. CONCLUSION

In my opinion, it is incontrovertible that our American free enterprise system is second to none. We have enjoyed a standard of living unsurpassed in the world. The contribution of the energy companies to this affluence is recognized by most economists. Without an abundance of cheap energy to fuel the economy and mechanized industry such progress would not have been possible. This service to the public has provided the necessities of food and shelter and many conveniences and amenities in addition. Long work days, and weeks have been eliminated. Economical transportation has been made available in many forms. There seems to be no question that an abundance of energy has been instrumental in the United States reaching a pinnacle of world power.

Now we are faced with a short-term energy shortage. Given time our vast potential resources can be developed and the long-term problem solved. But why have we allowed this situation to develop? Simply because experts in the energy field were given no credibility when they pleaded for sound government policies, when they pointed to the predictable results of price regulation below competitive levels, when they emphasized the undesirability of too great reliance on foreign energy sources, when they warned of the anticipated imbalance of trade resulting from excessive imports, when they argued unsuccessfully for the Alaska pipeline,

when they exhorted the government to make more federal offshore leases available, when they pointed out the inadvisability of attempting to reach environmental goals, however desirable, too quickly and when they supported a strong consistent national energy policy.

All of the above sincere appeals fell mostly on deaf ears. Now those, who because of prejudice or politics were dilatory in taking action, are suddenly trying to escape responsibility by accusing the industry of a contrived shortage, of hiding resources and of monopolistic practices. A small group, mostly from producing states, has tried for years to apprise Congress of the threat to our economic security but to no avail. Because of such myopia, critics of our industry are now proposing more regulation rather than less, a government corporation to explore for oil and gas, a greatly expanded governmental research and development effort, all as a smoke screen to divert attention from their well-documented, past negative actions and statements.

It is late but time may still be available. A strong effort should immediately be made to free our efficient, poised and experienced companies which comprise the nation's energy industry, so that we can start to correct a problem that will be with us for several years. Nothing could be more in the public interest. To take such action will insure that necessary oil and gas products will be made available in time at the lowest competitive price consistent with a viable industry and the price of alternatives. We can no longer afford to experiment with additional regulations, with an inefficient replacement for our free enterprise system and we can no longer delay adoption of a national energy policy that is consistent, objective and dedicated to long-term solution, not political expediency.

Between now and 1985, the nation's requirements for all sources of energy will increase materially. Among these sources, natural gas ranks as a premium form of energy for residential, commercial and industrial use. Its use in combatting air pollution is well recognized. Natural gas in the past has been selling at bargain prices. It would be unfortunate indeed if, for the want of a competitive price, millions of consumers were denied the kind of energy they want, need and are willing to pay for. It would be in the public interest to make such gas available.

S. 2860, insofar as it deals with deregulation of new and rededicated gas reserves, will accomplish the objectives which I have discussed. It is superior to the Administration Bill, S. 2048, in that the uncertainty occasioned by the retention of jurisdiction in the Secretary of Interior to "monitor" future gas prices is removed.

Although there are considerable disadvantages to the retention of FPC jurisdiction over existing gas sales, these are alleviated to some degree by the prohibition against reductions in rates after having once received the final approval of the FPC. This provides an element of "contract sanctity" which is lacking in the current law.

I must note, however, that the continuation of regulation over existing gas sales will continue to prevent the maximum effort which is needed in domestic exploration of gas. Depriving those producers who are in the best position to effectively undertake this exploration of the immediate capital needed to do the job is a serious deterrent. The incentive provided by the deregulation of new gas provides future capital but what is most needed is maximum effort now.

S. 2860 does go a long way toward correcting the basic cause of the current gas shortage, which is in turn a root cause of the broader energy shortage. While in my opinion it does not go far enough, it would provide a considerably better governmental atmosphere for increasing domestic gas supplies than the existing law.

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#### APPENDIX A

##### BACKGROUND STATEMENT—K. C. VAUGHAN

I graduated from the University of Southern California in 1933 with a Bachelor of Science degree in petroleum engineering. Following my graduation I joined Union Oil Company as a wellpuller. During subsequent years I held such positions as production superintendent in California, manager of field operations in the western region, and manager of natural gas and gas liquids division. In 1959 I was named manager of Union Oil's Gulf division in Houston, in which capacity I supervised all of Union's exploration and development activities in the State of Louisiana and the Gulf of Mexico. In December 1963 I returned to Los Angeles as Senior Vice President in charge of exploration and production for the corporation. In January 1969 I was elected President of the newly created Union oil and gas division. In this latter capacity I was responsible for all of Union Oil's domestic exploration and development activities and the natural gas and gas liquids functions of the company are among the activities which were under my supervision. I retired from Union Oil on November 1, 1972 and opened an office in Houston as a Petroleum Consultant to industry. In addition to my consulting activities, I have joined the Boards of Directors of Petrolane, Inc., Texas Gas Transmission Corporation, and Cordon International Corporation.

APPENDIX B

CHART 1  
AAPG and API Classification of Wells

OBJECTIVE OF DRILLING	INITIAL CLASSIFICATION $\phi$ WHEN DRILLING IS STARTED	FINAL CLASSIFICATION		
		AFTER COMPLETION OR ABANDONMENT	UNSUCCESSFUL $\diamond$	
Drilling for a new field on a structure or in an environment never before productive  Drilling for a new pool on a structure or in a geological environment already productive	1. NEW-FIELD WILDCAT	NEW-FIELD DISCOVERY WILDCAT	DRY NEW-FIELD WILDCAT	
	Drilling outside limits of a proved area of pool  For a new pool below For a new pool deeper than pool For a new pool above For a new pool deeper than pool	2. NEW POOL (PAY) WILDCAT	NEW-POOL DISCOVERY WILDCAT (Sometimes an extension well)	DRY NEW-POOL WILDCAT
		3. DEEPER POOL (PAY) TEST	NEW-POOL DISCOVERY WELLS (Sometimes extension wells)	DRY NEW-POOL TESTS
		4. SMALLER POOL (PAY) TEST	SMALLER POOL DISCOVERY WELL	DRY SMALLER POOL TEST
Drilling for long extension of a partly developed pool	5. OUTPOST or EXTENSION TEST	EXTENSION WELL (Sometimes a new-pool discovery well)	DRY OUTPOST or DRY EXTENSION TEST	
Drilling to exploit or develop a hydrocarbon accumulation discovered by previous drilling	6. DEVELOPMENT WELL	DEVELOPMENT WELL	DRY DEVELOPMENT WELL	

LABEL CLASSIFICATION OF WELLS, AS APPLIED BY CSP.

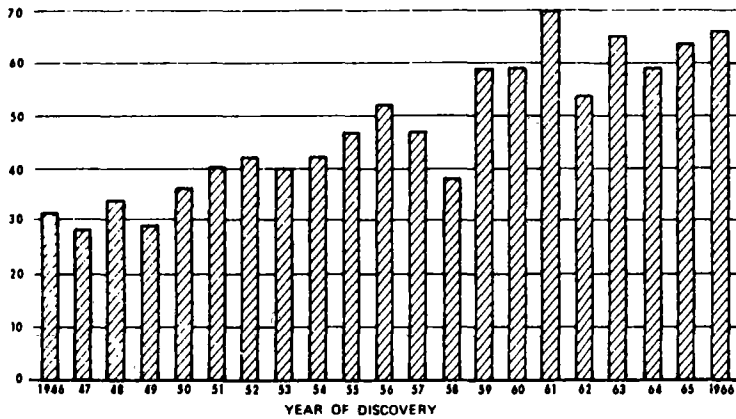


CHART 2

**SIGNIFICANT DISCOVERIES AFTER SIX YEARS HISTORY**

*"Significant" Fields with Ultimate Recovery Greater than One Million Barrels Oil or Six Billion Cubic Feet Gas*

**Number of New-Field Wildcats Required to Find One Significant Discovery**



*The Estimates are based on Six Years of Development History except for gas for 1952 and Prior Years*

**Percentage of New Field Wildcat Wells Drilled That Result in One Significant Discovery**

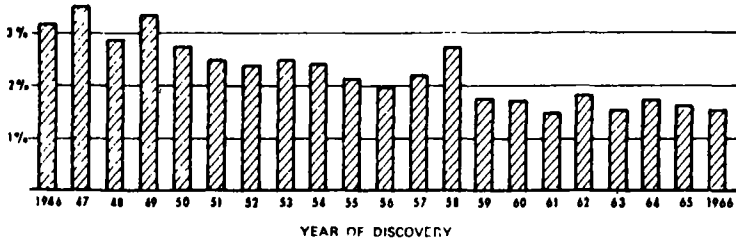


TABLE 1.—PERCENTAGE OF EXPLORATORY HOLES DRILLED IN EACH CLASS IN UNITED STATES IN 1968, 1969, 1970, 1971, AND 1972

	1968		1969		1970		1971		1972	
	Num-ber	Well per-cent	Num-ber	Well per-cent	Num-ber	Well per-cent	Num-ber	Well per-cent	Num-ber	Well per-cent
<b>Outposts:</b>										
Producers.....	444	27.8	540	33.3	306	32.3	309	31.0	349	33.5
Dry holes.....	1,151	70.0	1,083	66.7	832	67.7	688	69.0	693	66.5
Total.....	1,595	100.0	1,603	100.0	1,228	100.0	997	100.0	1,040	100.0
Class percent.....	18.0		16.7		16.0		14.4		13.8	
<b>New-pool wildcats:</b>										
Producers.....	271	17.2	386	23.5	235	22.5	224	18.0	225	21.4
Dry holes.....	1,306	82.8	1,256	76.5	808	77.5	927	82.0	828	78.6
Total.....	1,577	100.0	1,642	100.0	1,043	100.0	1,131	100.0	1,053	100.0
Class percent.....	17.8		17.0		13.5		16.3		14.0	
<b>Deeper pool tests:</b>										
Producers.....	110	29.8	143	41.8	93	35.9	75	31.9	86	35.1
Dry holes.....	250	70.2	199	58.2	167	64.1	160	68.1	159	64.9
Total.....	369	100.0	342	100.0	260	100.0	235	100.0	245	100.0
Class percent.....	4.2		3.5		3.4		3.4		3.2	
<b>Shallower pool tests:</b>										
Producers.....	26	19.6	96	69.9	54	58.1	66	68.0	59	52.2
Dry holes.....	107	80.4	42	30.4	39	41.9	31	32.0	54	47.8
Total.....	133	100.0	138	100.0	93	100.0	97	100.0	113	100.0
Class percent.....	1.5		1.4		1.2		1.4		1.5	
<b>New-field wildcats:</b>										
Producers.....	442	8.5	535	9.0	493	9.7	434	9.7	566	11.1
Dry holes.....	4,763	91.5	5,421	91.0	4,596	90.3	4,028	90.3	4,520	88.9
Total.....	5,205	100.0	5,956	100.0	5,069	100.0	4,462	100.0	5,086	100.0
Class percent.....	58.6		61.4		65.9		64.5		67.5	
Total producers.....	1,293	14.6	1,700	17.5	1,271	16.5	1,088	15.7	1,285	17.0
Total dry holes.....	7,586	85.4	8,001	82.5	6,422	83.5	5,834	84.3	6,254	83.0
Grand total.....	8,879	100.0	9,701	100.0	7,693	100.0	6,922	100.0	7,539	100.0

TABLE 2.—NEW-FIELD DISCOVERIES OF 1966, 1969, 1971, AND 1972, RANKED ACCORDING TO SIZE (ESTIMATED ULTIMATE RECOVERY)

Year of discovery	Reserve groups—Number of fields discovered in year indicated							Total, A-F inclusive, fields	Percentage of A+B+C+D fields in total fields	Percentage of E+F fields in total fields
	A	B	C	D	Sub-total	E	F			
1966.....	9	10	24	128	171	458	6	635	26.9	73.1
1969.....	0	5	8	108	121	399	15	535	22.6	77.4
1971.....	2	0	15	101	118	308	8	434	27.2	72.8
1972.....	2	2	10	96	110	453	3	566	19.4	80.6

Note: Classifications used for total ultimate recoverable reserves for oil and natural gas:

	Oil	Gas
A fields.....	Over 50,000,000 bbl.....	Over 300,000,000,000 ft <sup>3</sup> .
B fields.....	25,000,000 to 50,000,000 bbl.....	150,000,000,000 to 300,000,000,000 ft <sup>3</sup> .
C fields.....	10,000,000 to 25,000,000 bbl.....	60,000,000,000 to 150,000,000,000 ft <sup>3</sup> .
D fields.....	1,000,000 to 10,000,000 bbl.....	6,000,000,000 to 60,000,000,000 ft <sup>3</sup> .
E fields.....	Less than 1,000,000 bbl.....	Less than 6,000,000,000 ft <sup>3</sup> .
F fields.....	Abandoned as non-profitable.....	Abandoned as non-profitable.....

Equivalencies in classification of values between oil and gas reserves based on British thermal unit. For oil—6,000,000 Btu per barrel. For gas—1,000,000 Btu per thousand cubic feet. Thus: 1 bbl of oil is roughly equivalent to 6,000 ft<sup>3</sup> of gas, based upon approximate energy content.

STATEMENT OF KENNETH E. HILL, ON BEHALF OF THE GAS SUPPLY COMMITTEE,  
BEFORE THE COMMITTEE ON COMMERCE OF THE SENATE OF THE UNITED STATES,  
OCTOBER 24, 1973

My name is Kenneth E. Hill, I am an Executive Vice President of Blyth Eastman Dillon & Co. Incorporated, a New York City investment banking firm. I am the head of the Energy Division of the Investment Banking Department of Blyth, which is quite active in arranging financing for energy projects throughout the world.

I have been asked by the Gas Supply Committee to appear before the Commerce Committee to state my views on the amounts and sources of capital needed to expand natural gas exploration and development in order to increase natural gas supplies and production. The purpose of my testimony today is to demonstrate the necessity for deregulation of not only "new" gas but old "flowing" gas to provide the increased internal capital formation which would generate most of the needed funds.

#### 1. INTRODUCTION

In presenting my views on this subject, I feel I should state that what this nation is faced with in the current energy shortage is not the lack of an adequate energy resource base, but rather inadequate capital investments over a long period of time by energy companies in new projects designed to increase the supply of energy. This was due to a shortage of funds caused by an inadequate return on investments. Recognizing this cause for the energy shortage, an obvious cure would be the creation of an economic environment through free markets which would result in higher prices and would dramatically increase capital investments in energy-producing projects. In no sector of the energy economy has the cause of the shortage been more clearly identifiable than in natural gas where governmental constraints on wellhead prices have artificially expanded demand while curtailing supply. I feel the remedy is obvious: *the removal of governmentally imposed price ceilings on wellhead sales of all natural gas.*

#### 2. THE PLACE OF NATURAL GAS IN THE NATION'S ECONOMY

Despite our natural concern for individual citizens, the question of energy supply is not one which can be properly restricted to the use of energy by individuals for transportation, home heating, cooking, and air conditioning. The concern must be broader because the satisfaction of the demands of consumers for goods and services also requires energy. There is no sector of the nation's business or economy that is not dependent, either directly or indirectly, upon energy inputs. *Nearly three-fourths of the total energy utilized in this nation is related to business activity of all kinds.* This is why even temporary interruptions in the supply of energy, not to mention a pervasive shortage, will have a devastating impact on the nation's economy, on its standard of living and, conceivably, on its ability to defend itself against other world powers.

Nowhere in the economy is there a better opportunity for government to take constructive action to increase the supply of energy than in natural gas. Here the drastic underpricing of natural gas at the wellhead has so retarded exploration efforts that the obvious remedy, complete deregulation phased in over a short period of time, should be legislated as soon as possible. And with the price so low, demand has expanded dramatically. Yet natural gas is so clean, so non-polluting, and its quality so uniform, that it deserves a premium price. Furthermore, it is virtually invisible to the American public because its transportation and distribution facilities are largely underground. Perhaps this relative anonymity tends to obscure the important role natural gas plays in the overall economy, where it supplies nearly a third of all energy. The following table illustrates the preeminent position occupied by natural gas as a supplier of various sectors of the energy market.

	Natural gas as proportion of energy use (percent)	Natural gas rank among fuels used
Industrial .....	49	1
Commercial .....	60	1
Residential .....	52	1
Electric utility .....	24	2

It is apparent from the above that the natural gas shortage and emergency allocation programs to assure residential needs for natural gas strike at the very heart of our business and industrial economy. These curtailment programs serve only to assure the American worker that he will be warm while staying home from work because the factory is shut down for lack of gas supply. While programs to force conversion of gas-using facilities to other fuels may be necessary to assure continuation of essential quantities of gas for human needs, it must be recognized that these programs are only temporary expedients which tend to divert attention from the more important question of stimulating investment in new gas discovery and development projects in order to insure expanded natural gas supplies.

### 3. RELATIONSHIP OF NATURAL GAS REGULATION TO CAPITAL FORMATION

Since 1954, the federal government has exercised price control over wellhead sales of natural gas sold in interstate commerce. These controls have primarily reflected political considerations of "consumer protection" and have given little attention to the supply-dampening consequences of such actions. This wellhead price regulation has consistently kept gas prices at a level far below the equivalent Btu prices of other fuels. Consumer needs for natural gas over the decades of the 50's and 60's were primarily met by a drawdown of large inventories of natural gas reserves discovered during and shortly after World War II, often while drilling for crude oil. During this period, the substantial underpricing of natural gas relative to other energy forms severely restricted the ability of gas producers to generate the capital funds required to carry on a continuing search for natural gas at a level necessary to keep pace with the expanding consumption of gas. Further, these unrealistically low natural gas prices substantially undercut incentives to reinvest the limited funds that were available in natural gas exploration. *There is no question but that these natural gas price controls caused capital funds to be diverted to other areas of investment.* After all, it was easy to determine the relative advantage of spending available drilling dollars looking for \$3.00/bbl oil rather than 10¢/Mcf natural gas at the wellhead.

The level of investment devoted to the search for oil and gas depends in large part upon the rate of return expected for the expenditures and this, in turn, hinges on the price the producer expects to receive for natural gas and crude oil. In the case of natural gas, the National Petroleum Council has estimated that the rate of return gas production was earning during 1970-1972 in the United States was in the range of 6 to 8 percent on average net fixed assets, about half that required to induce new investments of importance into such a risky business and about half that for oil. It seems clear that if the price of natural gas has reflected its market value relative to other forms of energy over the past two decades, the oil and gas industry would have generated substantially larger funds from its sales of natural gas. And most of these additional net revenues would have been devoted to further exploration for natural gas as well as oil (the return having been made nearly co-equal) and we would today have substantially larger reserves and producibility for natural gas.

*This inability of the domestic petroleum industry to finance an adequate search for oil and gas commensurate with the rising demands for their products has been apparent for at least 10 years, a matter upon which I first commented as early as 1962. Over the 10-year period, 1962-1971, the annual rate of expenditures for exploration and development according to the Chase Manhattan yearly studies of the domestic oil industry has averaged about \$4.5 billion but with the amount fluctuating widely depending on the amount of offshore lease sales in a given year. During the same period there have been inflationary cost increases in drilling and equipping wells, total drilling has decreased by nearly 50 percent, and the finding rate per foot drilled has steadily declined, so that the rate of expenditures has fallen progressively behind the capital investment needed to replace and enlarge our indigenous reserves of oil and gas. Since consumption steadily increased during this period, our self-sufficiency*

*deteriorated to the point where we have been forced to rely upon imports of oil and gas to meet all new demand increments.*

To illustrate, in the 15 years between 1955 and 1970, the domestic petroleum industry spent \$68 billion in its efforts to discover new oil and gas sources. However, Chase estimated that to have discovered enough oil and gas to satisfy the needs of consumers during that period and to maintain a realistic inventory of reserves, drilling efforts should have been 75 percent larger and the investment should have been an additional \$50 billion. Had investments of this level been made over the past 15 years, there is no question but that the nation would today be in an immeasurably better supply posture to provide our energy needs. But such an investment effort was impossible under the prevailing price structure for oil and natural gas. During that period, prices for oil and gas were essentially level and the overall rate of return on average invested capital was slowly declining from about 13 percent to less than 10 percent in 1972, evidence of inadequate capital formation due to prices that failed to rise in proportion to escalating replacement costs of oil and gas.

#### 4. LEVELS OF CAPITAL INVESTMENT REQUIRED TO MEET CONSUMERS DEMANDS FOR OIL AND NATURAL GAS

The National Petroleum Council has recently prepared a study of the outlook for energy in the United States which estimated demand for oil and gas through 1985. For oil the demand varies between 20 and 30 million barrels per day in 1985, depending upon the amount of natural gas available, as compared with last year's 16 million barrels per day. For natural gas the potential demand was estimated at 39 trillion cubic feet in 1985, which is a 70 percent increase over last year's consumption of 23 trillion cubic feet. If these demands for oil and gas were to be satisfied from domestic sources in the same proportion as in the past 15 years, the petroleum industry drilling effort would have to more than double. The cost of such an effort would probably be at least \$140 billion for the period 1971-1985, measured in current prices, as compared with the actual outlays of \$68 billion from 1955 to 1970. To the extent that inflation continues and productivity of drilling continues to decline, the required outlay would involve a substantially larger amount.

Under a continuation of the existing political and economic framework, there is no likelihood that the industry can finance a search of this magnitude. For in considering these capital requirements, it must be remembered that the total demands for capital funds are far larger than those required to search for oil and gas. The NPC has estimated that all expenditures for the oil and gas industry, including exploration and production, transportation, refining and marketing facilities, could total as much as \$240 billion during the 15-year period ending in 1985. But these sums simply cannot be raised by internal capital formation and substantial recourse to outside sources of capital will be required. In recent years, as much as 25 percent of all capital expenditures were obtained from outside sources, principally borrowings, and if this were to continue over the 15-year period, about \$60 billion would be required. But with an already relatively high debt ratio for most companies and the low prices prevailing for common stock equity in the energy industry, it is doubtful that much more than half this amount could be obtained from external sources. So the necessity for increased internal capital formation becomes obvious and imperative. And this can only occur through greater profits provided by higher prices, first for natural gas which is so distinctly underpriced, then for crude and products.

The National Petroleum Council has recently finished a thorough study of the outlook for energy for the United States for the period 1971-1985. One of the task forces focused on the increased exploration and development needed to supply as much of the potential demand for gas from United States sources as possible. The NPC analyzed four cases in detail for both oil and gas, varying according to the rate of drilling and the discovery rate per foot drilled. Case IV is the most conservative and is based on a continuation of the current low finding rate coupled with the current downtrend in drilling rate. It presupposes a modest increase in prices but a rate substantially less than the expected inflation in costs while capital expenditures reach only \$88 billion over the period. Cases II and III are intermediate combinations of these factors. Case I has a higher rate of finding than we have recently experienced combined with a rapid growth in drilling. This postulates much higher prices over the period which provides both the capital and the economic incentive to expand exploration and development drilling. Under these various assumptions the capital expenditures required, as well as the "average prices needed" by 1985, are calculated, while earning a 15 percent rate of return on

average net fixed assets. I believe it is instructive to focus on Case III which is a continuation of the current finding rates (1971 and 1972 have continued the recent poor record in finding new reserves) and moderately increasing drilling rates under the stimulus of rising prices, as probably the most plausible outlook. Under Case III the total capital expenditures for exploration and development of oil and gas are expected to total \$135 billion over the period 1971-1985, an average of about \$9 billion each year and reaching \$13 billion in 1985. This is more than double the average rate of \$4 billion in recent years. Of this amount, \$46 billion, or about one-third, will be expended in the search for natural gas. And the annual rate of outlays for natural gas will more than double from \$2.1 to \$4.3 billion in 1985.

What prices for oil and gas are required to generate these funds? The NPC studies assume that the price of crude oil in Case III will reach \$6.60 per barrel in 1985; (some world prices are already approaching this level). Natural gas prices for all production (old and new) were assumed to average 53¢ per Mcf in 1985; (most new intrastate prices are already above this level). But this price will still be substantially below the equivalent price for oil at \$6.60 by a factor of nearly one-half.

And what do we get for these increased expenditures? The NPC estimates that wellhead production under Case III will still decline slowly in the United States from its present level of just over 22 trillion cubic feet in 1971 to about 21 trillion cubic feet in 1985. But without these stepped-up expenditures, Case IV indicates that production of natural gas in the United States will steadily decline to 15 trillion cubic feet in 1985. And there will, therefore, be an unsatisfied potential demand of about 18 trillion cubic feet to make up from gas imports, coal gasification, etc., and by the substitution of oil imports. Thus projected increases in average wellhead prices over the next 13 years from 22¢ per Mcf to 53¢ per Mcf are still inadequate and do not nearly satisfy the potential demand of 39 trillion cubic feet. This result is sure to occur because continued regulation of the price of natural gas was assumed under these studies and even in 1985 was therefore assumed to be selling at a substantial disadvantage from the expected priced of competing fuels on a Btu basis. It is just this perpetual price disadvantage for natural gas that is such a dead economic loss for the United States. For here we are, proposing to import natural gas at prices substantially higher than \$1.00 per Mcf from Algeria and Russia, while at the same time refusing to allow prices to rise in our country to the market clearing level. It is only by allowing domestic price increases that we will learn where the market clearing level is and whether we really need these foreign supplies at all. What we are clearly doing is "rolling in 'the incremental' new" and foreign gas supplies while fooling ourselves that our prices are only rising slowly, but at the same time refusing to admit that old gas is being produced at confiscatory prices not even remotely approaching the replacement or market clearing level. And for every additional trillion cubic feet we find within the U.S. by allowing prices to rise, we save at least \$1 billion of badly needed foreign exchange in imports.

##### 5. THE RELATIONSHIP OF PROFIT LEVELS TO INTERNAL GENERATION OF CAPITAL FUNDS

One of the greatest sources of misunderstanding with respect to the petroleum industry at this time is *the confusion over the level of profits as compared with profitability or return on invested capital*. The press and some observers of the industry have leveled criticism against the industry because of *the simultaneous occurrence of record levels of profit and spot shortages of petroleum products*. The intuitive deduction of many unfamiliar with the industry is that with the higher levels of profits the necessary funds for expansion of supply must surely be available. And some of the industry critics appear to believe that petroleum industry profits are excessive. In my opinion, none of these conclusions are correct; *capital funds from within the industry are inadequate, profitability on investment is low despite recently higher profit levels, and return on capital in the petroleum industry is below average for manufacturing in general*.

For answers to these accusations, the long series of data compiled by the Chase Manhattan Petroleum Department of a group of the largest oil companies is most useful. This group of companies produces about 80 percent of the world's output of crude oil and two-thirds of the United States production while in refining the group is responsible for three-fourths of the world's throughput. But within the United States this representative group of the petroleum industry has had a steadily declining rate of return on average invested capital, falling from nearly 13 percent in 1966-1968 to an average of 9.5 percent for the period 1970-1972.

For the first half of 1973, the earnings of this group of companies are estimated to have increased by nearly 50 percent over the first half of 1972 with much of the increase coming from abroad. But this level of profits, while gratifying, must be compared with 1972's quite poor earnings for the first half. Estimates for the full year 1973 profit would indicate that this group could earn about 35 percent more than during all of 1972. But even this level would only indicate an overall return for the group of about 11 percent, and about 10.5 percent within the United States. This is still quite inadequate when compared both to historical levels for the petroleum industry of over 13 percent, and to all manufacturing which will will certainly also increase dramatically in 1973.

The First National City Bank publishes data for all manufacturing on a yearly basis, which measures rate of return, but on net worth rather than average invested capital. For most of the recent past until 1971 the rate of return for the petroleum industry has been about the same as for all manufacturing industries. In 1972, however, petroleum's rate of return fell to 10.8 percent on net worth while the return for all manufacturing rose to 12.1 percent. It is simply not rational to expect the massive increased investments required to meet today's energy shortages while the petroleum industry achieves rates of return much less than those of manufacturing in general, which do not have the geologic, financial, and foreign political risks experienced by the petroleum industry. *The required enormous investments to meet growing energy demands can be forthcoming only if dramatically improved earnings are achieved by the petroleum industry and the rate of return, no matter how measured, rises again to a level greater than of all industry in the United States.*

In order to provide higher returns on gas exploration and development activities it is necessary that revenues from gas be increased. This means not only higher prices for new natural gas to be discovered in the future, but higher prices for gas which is currently flowing to market. Because of the quite long lead times between the decision to invest in new gas exploration projects and the availability of funds from those exploratory wells which turn out successful—often three to five years later—it is apparent that the prospect of improved profitability from only future operations is not sufficient to provide needed funds currently. A governmental policy which recognizes the necessity for higher gas prices for only those gas supplies to be discovered in the future will not provide sufficient generation of internal funds under the most optimistic of future estimates of natural gas discovery. What must be done is to remove, over a reasonably short period of time, all constraints on gas prices of all vintages, sources, and varieties. It must be recognized that this does not mean that the revenues from all gas sales will rise to the highest level available for new gas supplies; Mrs. Gody's presentation here clearly indicates the restraining influence on prices exercised by existing contract provisions. The phased-out removal of all restrictions on flowing gas revenues would give the industry the opportunity to realize steadily increasing revenues from old flowing gas, as well as negotiating arms-length prices for "new" gas, and thus increase substantially the amount of internally generated capital. Only thus will it be possible to finance the massive new exploration and development investments in new natural gas reserves required if the needs of gas consumers are to be met over the next decade.

## 6. CONCLUSION

I have discussed at length the unnatural conditions in the overall energy market which have prevailed over the past decade created by price controls imposed upon wellhead natural gas prices. As I have suggested, artificial price constraints on natural gas have not only resulted in insufficient gas supplies, but have held down prices of other forms of energy and contributed to shortages for them as well. The result has been that consumers have enjoyed an era of cheap energy of all kinds, which unfortunately has ended here as well as abroad. For years the consumers of energy within the United States have been able to put off making decisions as to the priority which energy occupies in their budgets. Thus, Mrs. Gody's studies show that on average consumers spend less for natural gas than for such items as toilet goods, tobacco products, or alcoholic beverages. Under these circumstances, it is obvious that energy prices simply have not seriously entered into deliberations by consumers as to the disposal of their income.

Unfortunately, this nation has reached a point where each individual consumer must concern himself with the supply of energy available—and therefore the price of that energy. If all of us as consumers are to have sufficient energy to meet our needs in the future, we must all pay prices which reflect the relative market

value of various energy forms and which provide the incentives to produce adequate supplies. Perhaps more importantly, unless governmental policies are drastically changed in order to allow all energy prices, particularly natural gas, to increase to market clearing levels, the consumer will be denied the choice whether to pay more for energy or restrict his consumption. Continued inadequate profitability levels in the energy industry will assure that the consumer has no choice but to endure widespread energy shortages.

It is hoped that this testimony demonstrates the great economic desirability for the United States of allowing wellhead natural gas prices to be decontrolled over a reasonably short period of time. Only thus will the price reach the level that assures the maximum in supply and ultimately balances supply with demand. Furthermore, this makes great economic sense since it will be cheaper for the consumer than imports, will add hydrocarbon wealth to the nation, and save untold billions in the outflow of funds for the importation of natural gas or crude oil to replace unavailable natural gas.

Senator GRAVEL. Thank you, Mr. Hammond and Mr. Vaughan. I would like to put a few questions to you. Some time ago, before the price of oil jumped so drastically, it was three times as expensive for oil on a Btu basis than for gas because of the regulated nature of that gas.

Can either of you tell me, if you know, right now with the new cost of oil, what the comparison would be, if there has been more of a jump in the cost of oil than there has been in the cost of gas?

Mr. HAMMOND. I think it is a mathematical exercise, but I believe somebody told me yesterday that \$9 oil would equate to about \$1.50 gas.

Mr. VAUGHAN. Mr. Chairman, there are about 6 million Btu's in a barrel of oil, and there are about a million Btu's in an Mcf of gas, so a good rule of thumb is a 6-to-1 ratio.

Senator GRAVEL. Give me that again. One barrel of—

Mr. VAUGHAN. There are about 6 million Btu's in a barrel of oil, and about 1 million Btu's in an Mcf of gas. So if natural gas were to sell even as high as a dollar an Mcf, this would be the equivalent of \$6 per barrel. If it were 50 cents, it would be \$3. At the present average interstate price for natural gas that would mean at present day prices the interstate market is buying that gas from producers at \$1.50 per equivalent barrel.

Senator GRAVEL. You do not have a chart on that anywhere?

Mr. VAUGHAN. We could certainly furnish that to you.

Senator GRAVEL. Could you please?

I think it would be very valuable for our argumentation when we are comparing costs.

Mr. VAUGHAN. Again, as a rule of thumb, 6-to-1, 6 Mcf of gas for each 1 barrel of oil.

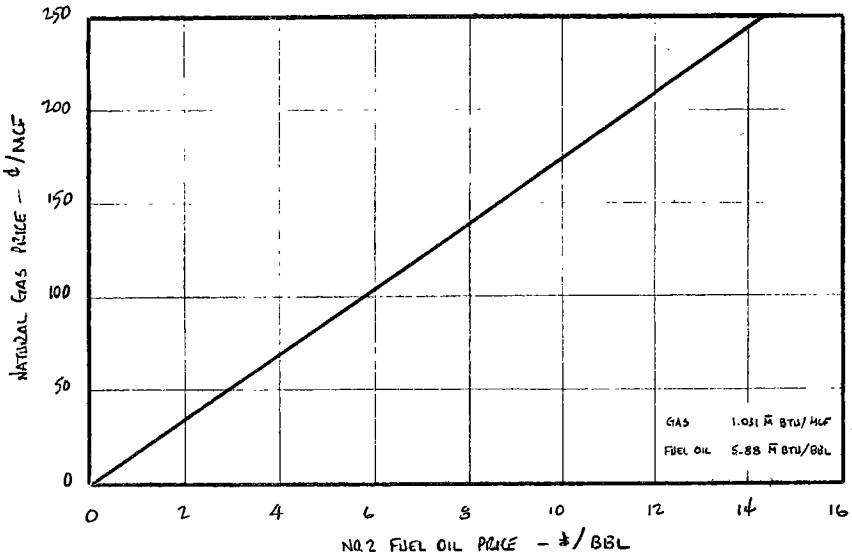
[The following material was subsequently submitted for the record:]

#### COMPARISON OF FUELS PRICES ON HEATING VALUE BASIS

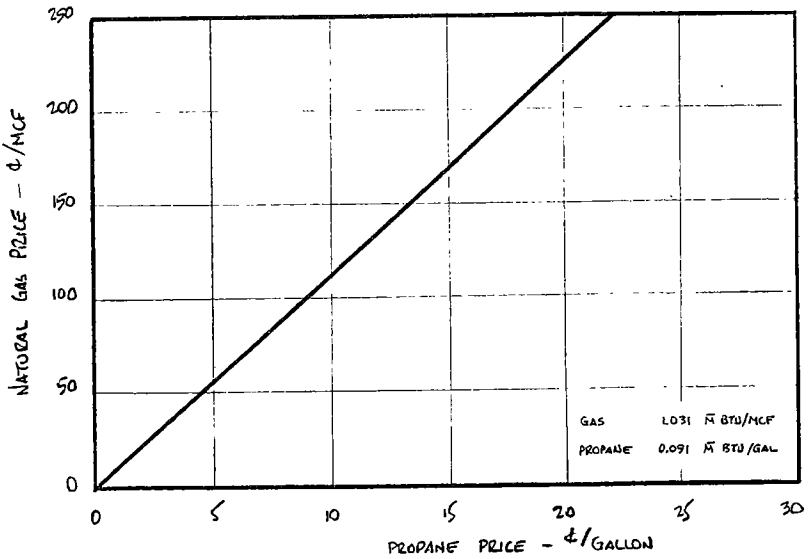
Fuel prices are commonly expressed in terms of the normal unit of measurement for the fuel; i.e.: gas—¢ per thousand cubic foot (Mcf), oil—\$ per barrel, propane—¢ per gallon, coal—\$/ton. These prices can be equated by relating them to the heat content of the fuel, commonly expressed in British thermal units (Btu). For example, natural gas contains approximately 1.03 million (M) Btu per Mcf and crude oil contains approximately 5.8 M Btu per barrel. Thus, natural gas priced at \$1.00 per Mcf is equivalent to crude oil priced at \$5.63 per barrel. The attached plots of gas price versus prices of other fuels are based on average values of heat content and do not reflect factors such as transportation, storage, emission quality, thermal efficiency, etc. which can vary significantly between fuels.



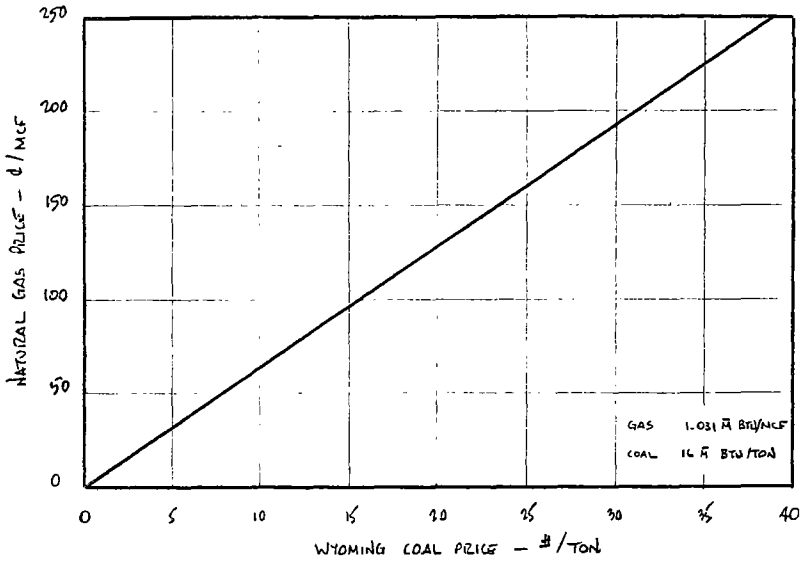
COMPARISON OF PRICES  
FOR  
NATURAL GAS & NO. 2 FUEL OIL



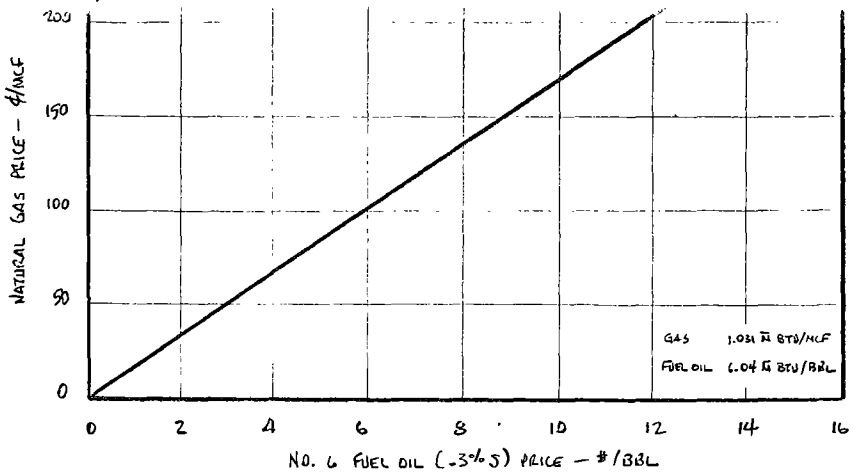
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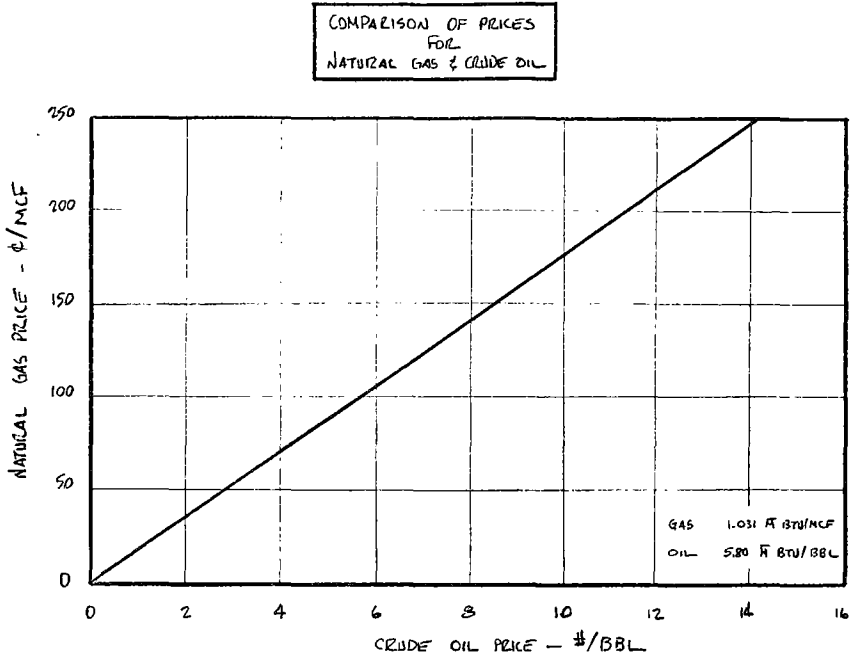


COMPARISON OF PRICES  
FOR  
NATURAL GAS & WYOMING COAL



COMPARISON OF PRICES  
FOR  
NATURAL GAS & NO. 6 FUEL OIL





Senator GRAVEL. Neither one of you touched on the Btu tax in my bill, S. 2806. We tried to create an energy trust fund. That is for the public areas. You spoke on deregulation, and, obviously, I agree with you for in this way my bill would help fund the capital requirements of the private sector, which you both represent. It is in the funding of the public sector that I proposed a Btu tax. Now, we had testimony this morning that the Btu tax—no, it was yesterday, I believe—that Mr. Miller was fearful the Btu tax would discriminate against gas as opposed to oil. And again, this morning, Mr. Simon felt it would probably discriminate against coal, as opposed to gas or oil. I do not see that, and I am just wondering if you see it the way I do.

Mr. VAUGHAN. I have some opinions—I have not studied it—with respect to the effect of one source of energy versus another. My own feeling is that since energy is an important element in our entire economic life, either as residential users, as commercial users, as industrial users, as a part of our entire economy, it would seem better to me, however valuable this energy trust fund—and I think that is an excellent idea—that that money should best come out of a general fund or it could be supplied by, let us say money generated by bonus bidding or generated by the royalties on Federal oil and gas, rather than imposing specific tax.

Senator GRAVEL. Sure.

Well, in point of fact that revenue is more specific, you see, because we hold the bonus bids on public lands for these fossil fuel areas. And so, therefore, the people who consume energy from that source pay a tax to the trust fund. But the people who consume energy from Grand Coulee Dam or Bonneville Dam do not pay a similar tax on energy they consume. So, for one thing, you have a geographic skewness,

and also a technological skewness, because only one type of fossil fuel is taxed to carry the full turden of R. & D., though some of the R. & D. money is going for solar, some for nuclear, some for geothermal and some for fossil fuels.

The point I think is that we should not take one part of the total energy system and make it carry the all of the R. & D. for the whole spectrum of energy possibilities.

Mr. HAMMOND. Except that I believe the bonuses and royalties for offshore sales go into the general fund.

Senator GRAVEL. They do.

Mr. HAMMOND. So in effect what you are saying is—

Senator GRAVEL. It would be appropriated from the general fund.

Mr. HAMMOND. It would be appropriated from the general fund, so in effect the whole economic system will—

Senator GRAVEL. Well, it was not included in this bill because I did not have the time to finish it up, but I will introduce another bill that will see us do away with bonus bidding. I think it does not make any sense on the part of the government to create incentives—whether they are investment tax credits or depletion allowances—and at the same time take them away by requiring all this front money and the gamble that the ground that is leased and paid for has oil underneath it. I think it merely adds to the capriciousness and difficulties of the industry. We take the money from the private sector, which needs capital, and put it into the general coffers of the Treasury. I do not think it raises that much money, and I think it deprives industry of money that could better be used. I would rather see the money used to drill holes and find oil and bring it to market, than paid to the Government as though it were income taxes. Why have this extra burden?

I will be putting in legislation to go to a graded system, more of a situation where you do not have to put in a front. You just commit yourself as to how much money you will spend in finding the oil.

The other problem that goes against the general fund idea, and that is the other point you made, is that the money to pay for R. & D. would have to come out of the general fund. That is the way we are presently doing it. And right now we have a high water mark of about \$1 billion for all of our energy R. & D., nuclear and otherwise.

Well, a \$1 billion effort, even if we double it, would be quite considerable from an appropriations point of view. But that appropriation has to compete with all of the other activities of Congress which require funding, and this is one of the reasons why we will never truly commit ourselves nationally to a program if we do not find some unique way of funding it that has some long-term consistency. The example that we use, and it is the only example we have in this country, is the highway trust fund, where we had a problem, where the money was put into a trust fund and went out automatically. That is what would happen with an energy trust fund. We would have guarantees of continuity of appropriations that would not compete with, let us say, education, social service and all the other activities of Government. Under our process something may go into the Treasury, but it may not necessarily come out on a swap for something else. Every item hangs by itself as it goes into the Treasury, and every item hangs by itself as it comes out of the Treasury. So the bonus bid income may not mean

one more sou to R. & D. for energy, because there is another process that the Congress would use to apportion it.

Mr. HAMMOND. Mr. Chairman, if I may I would like to respond to two or three of your suggestions.

Senator GRAVEL. Please.

Mr. HAMMOND. And I know, in view of your interest in energy that you are going to keep it on the front burner until we get something resolved.

I would suggest that there are some problems, considerable problems, with abandoning the bonus bidding system. This is a question that I have looked at from time to time over many years, and I come to the conclusion each time that, even though it has the faults that you have described, there is a lot of front-end money, that in our system in our country bonus bidding serves the country better than anything else.

For example, when you commit a bonus bid for a tract you are committing yourself to then immediately develop that tract. You are not going to spend the money on that lease to get it and then sit on it. That means that every time you have a lease sale and you come out with these successful bidders, they are going to develop those leases as quickly as they can. You eliminate the speculators who buy the leases and then try to peddle them to somebody else who would take them for profit to the bidder. When you limit it to bonus bids you know who the highest and best bidder is.

Second, when you have competitive bonus bidding in an offshore or any area, the person that gets that tract and the one that bids the most money for it is the person who thinks the highest, has the highest opinion of its prospects. There again, you are going to then channel those peoples' effort into those leases that they think are the best. I do not think you are going to get that in some other system, so while we are not discussing that bill today I would like very much to—

Senator GRAVEL. I think it is very important because we are talking about, regardless of the specifics of this bill, the question of how to get capital into the hands of industry to do a job. And we can do that through deregulation, which I think is the main concern. So I think the conversation is very germane.

Let me ask about the system the British have employed on the North Sea, where the action is right now in the oil industry. That was not on a competitive basis was it?

Mr. HAMMOND. I am not too familiar with that system, but Mr. Vaughan is. Let me just say this before I turn it to him. Any time you have a bonus system, competitive bidding, there is not any doubt who the highest and best bidder is. Whenever you have a system which uses negotiation as to which bid or which person would develop a particular area, you open it up to subjective determinations that make it difficult to administer fairly.

Second, in the North Sea you are dealing with large tracts, essentially undeveloped area, and in our country we are dealing under the Mineral Leasing Act with small tracts of 5,000 acres. And so commitment to work bonuses or work program could very well lead to wasteful exercise of development of those tracts.

Mr. Vaughan, may I please add to that?

Mr. VAUGHAN. I am not a complete expert by any means on bidding in the North Sea. However, you are, in part, correct. Each producer who was awarded one of those leases had to put up a satisfactory work proposal, a number of dollars or a certain amount of geophysical work, and almost always including the drilling of one or more wells. And, believe it or not, at that time those bids were reviewed almost by one man in the British Government, and the awards were made almost on the basis of that one man.

I could not possibly visualize a similar situation taking place in this country. I do not believe it will take place there again.

They also, however, bid several of the more desirable tracts, and those were awarded on the basis of the highest bid, and those bids, if I recall correctly, were in between \$10 million and \$50 million each. There has been a good deal—

Senator GRAVEL. Is that bonus money or income?

Mr. VAUGHAN. Bonus money.

There has been a great deal of agitation since that time, of course, to pursue this route of awarding leases, rather than the selection of individual operators on the basis of their work commitment and more or less on the basis of some one man or a committee's decision as to who should get the leasing. So I would strongly suspect that the future leases in the North Sea very likely may also go in the bidding direction.

Senator GRAVEL. That is interesting. I was not aware of that change. I knew it had been done by an agency of the British Government. I did not know it had been one strong personality. Apparently he is honest, because there has never been a scandal that has been attached to it.

Mr. VAUGHAN. I do not want to characterize it as a change. It certainly was a test, a trial effort on the bidding situation. I do not want to suggest that they have decided at this moment to go the bonus route, but certainly they have given it trial. The bonuses submitted were substantial, and there is a good deal of agitation to continue that direction.

Senator GRAVEL. Who is the individual in charge of this?

Mr. VAUGHAN. I am very sorry. My memory is not that good.

Senator GRAVEL. Do you know anybody over in the agency? Perhaps one of your assistants would know?

Mr. VAUGHAN. He tells me it is the Minister of Interior.

Senator GRAVEL. The Minister of Interior for the British Government. We will write him a letter and tell him about his reputation as an honest person.

[An excerpt from a letter received from the Gas Supply Committee follows:]

GAS SUPPLY COMMITTEE,  
Washington, D.C., January 29, 1974.

Hon. MIKE GRAVEL,  
U.S. Senate,  
New Senate Office Building, Washington, D.C.

DEAR SENATOR GRAVEL:

\* \* \* \* \*

The name of the individual in the British government who was almost solely responsible for the award of North Sea blocks to the oil industry in return for agreed-upon work commitments was Angus Beckett. He was Director of Mines, a civil service post, under the Minister of Power.

If we can furnish additional information, let me know.

Yours very truly,

W. O. SENTER.

Mr. HAMMOND. Mr. Chairman, may I add one other factor to this? Senator GRAVEL. Please.

Mr. HAMMOND. Someone mentioned this morning that the major oil companies set the policy for development of the industry in the United States.

Senator GRAVEL. Well, I will even phrase it better than that. I have heard the charge in debates all morning long that the oil industry is just one big cartel that commands the price and everybody just heels to.

Does that help you phrase the question a little better for you?

Please respond to that.

Mr. HAMMOND. I just wanted to tell you that Congress and the Government sets the policy for the domestic economic setting in which the oil industry must operate. And one of the factors that we have had to deal with in the past is a restrictive leasing policy in Interior. In other words, few lease sales and not too many acres put up in each sale.

Whenever—it is the law of supply and demand again. If you restrict the supply of desirable leases you are going to have a great many people come in and seek that limited supply. As Mr. Vaughan mentioned in his summary, the fact that these companies have bid these large sums for these leases indicates not only their willingness and their desire and the fact that they are anxious to spend money in developing our domestic reserves, but also that we have not had enough of them. And what I would urge is that the Department of Interior have more frequent lease sales, and put up more acreage at each sale, and we will have more development, and the ownership of those leases will be spread out into a greater number of people.

Senator GRAVEL. What would be the impact of putting up, rather than the bonus bid—because I am persuaded there is great merit in the discipline of the dollar sign in one's actions, particularly within the business community—what about, from the public's point of view, if we receive bids based upon how much you would give the Government in royalty income?

In other words, discipline of action makes the front runner, as you so very ably outlined. Could not that same discipline be exercised in the amount of royalty or severance tax that the Federal Government could receive?

Let us say if it is 12 percent, then they pay 12 percent severance tax, which is part of the lease. Suppose we said there is no front money and we will entertain bids as to one, a description of the work you will do on the tract, and two, how much you will give the Federal Government or the people of this country as a percentage of what you find if you are successful on that tract.

Would not a company as sure as it can be that there is something there be more inclined to give a better deal to the Federal Government as an inducement to get the tract, and would not that, which is translated into dollars only after the fact, be as good a discipline on the prospective activities of these companies as a bonus bid?

Mr. HAMMOND. Two observations come to mind on that suggestion. The first is, in my opinion if a person does not have to put up dollars at the time he gets the lease he does not have the discipline as to what he will bid or what he is going to commit to that lease. So that, say a person looks at the geophysics of a particular tract and he says, well, that looks pretty good, and I will bid a third royalty on that. And he

gets it, but is not thinking about developing that. If he gets that for a third royalty, he may be able to turn it to somebody else to develop.

Senator GRAVEL. Should we not solve that problem, though, by requiring that to bid you have to perform, and that you do not sell?

Mr. HAMMOND. Well then you come into how much is that person going to commit to the exploration of that lease, and if you then bid work dollars you are back to the bonus system, and he is going to spend that money whether it is justified or not. You come into the wasteful aspect of it.

Mr. VAUGHAN. Mr. Chairman, a well-known independent by the name of Mike Halbouty.

[An article by Mr. Halbouty follows:]

#### Proposal for Leasing Federal Offshore <sup>1</sup>

(By Michel T. Halbouty <sup>2</sup>)

I want to propose to the people of this land, to the Congress, and to the President of the United States, a new formula—a new method—for leasing the offshore which would expedite and surely result in more discoveries and greater reserves of petroleum, which this nation so badly needs.

The most recent bidding for leases in offshore Louisiana gave the government \$1.6 billion in bonuses.

This is absolutely absurd from any standpoint. This nation is short of oil and gas. Exploration and drilling for these resources cost money, and nowhere more than in the offshore. Yet, our government has created a system by which \$1.6 billion is required for bonuses, bonuses which represent a total waste of money that should be used for exploration and development of the leases themselves. The bonuses stifle exploration by creating additional costs which reduce and restrict more exploration. High bonuses also reduce the ultimate income the government receives because of the limited exploration of the leases granted.

Statistics show that more exploration conducted on a prospect or in a given area results in a greater success. The concept of the new formula described below will increase the competition of bidding, thereby insuring the ultimate in exploration of the leases involved.

The new formula is as follows.

1. Bids will be conducted on blocks as is currently the custom. These bids will be made on a cash basis.

2. The successful cash bids accepted will not be paid to the government but will be an obligation on the company to spend that sum on the block in exploration and development. Once that amount is spent, the company's obligation to the government will have been fulfilled. If the full amount is not spent, then the difference will be paid to the government in cash.

For example, \$50 million is the successful bid on a block of leases. The block is productive and, after deduction of all exploration and development costs incurred *after* the leases were granted to the company, there is a deficit of \$20 million to meet the original bid amount. This \$20 million will be paid directly to the government.

3. If the block of leases is dry, the cash difference between what was bid and what was spent on exploration and drilling after the leases were granted to the company will be paid to the government. For example, the original successful bid amount is \$50 million; exploration and dry holes cost \$10 million; at this point, the company chooses to abandon the leases and at the same time pays the government \$40 million in cash.

4. Such a formula would encourage greater competition for the original bids because the operating company would know that part, if not all, of the bid amount would go into future exploration and, hopefully, development of the blocks. This, in turn, would result in greater exploration of a block before the leases were

<sup>1</sup> Manuscript received and accepted, March 31, 1973.

This is an excerpt concerning a new offshore proposal for leasing from a speech entitled "It Is Too Late For Herpicide" delivered by Michel T. Halbouty before the Association of Oilwell Servicing Contractors on March 2, 1973, in Houston, Texas.

<sup>2</sup> Consulting geologist and petroleum engineer, independent producer and operator.



abandon and surely would result in finding new reserves which would not be found if only one dry test were drilled.

5. The government would, in the long run, because of more discoveries under this policy, receive far greater returns in additional royalties than from a cash bonus, and the government still would be protected by, and would receive cash payment paid on abandon blocks, as well as those which were productive although the original bid amounts were not consumed. After being awarded the leases, the operating company would have additional time to conduct more exploration on blocks prior to drilling, thus insuring a greater ratio of success. Operators would have time to obtain proper drilling equipment and schedule drilling in an orderly manner. The new formula also would save the company the tremendous amount of interest on the bonus money paid under the present immediate-payment policy.

6. It would create a better rapport between government and industry as government becomes a greater and more interested partner.

Senator GRAVEL. I know of him.

Mr. VAUGHAN. The ex-president of the American Association of Petroleum Geologists for a couple of years, recently made a suggestion which might be a compromise, and that was, you would retain the bidding system as it now exists, except that the winning producer or operator would be allowed to take credit against any expenditures he made on that lease. Any failure to spend the full amount, however, would still be—he would still be required to pay the difference of the total bid back to the Federal Government. But it would be an added incentive, and it would mean that at least a portion of the bid as submitted would go directly into drilling and into development and so forth. I think the suggestion is—

Senator GRAVEL. About 8 percent of it.

Mr. VAUGHAN. I think the suggestion bears some consideration.

Mr. HAMMOND. I had a second observation on the other, and that is that any time you increase the proportion of the royalty that goes to the Federal Government, you accelerate the point at which it will no longer be economic to produce that lease. In other words, if you—now, offshore, one-sixth goes to the Government—if you increase that, say, to a half or to 40 percent, and the operator out of the balance must pay all of the costs of operation of that lease, then it is going to reach the abandonment stage sooner than it otherwise would.

This, then, would create a situation where a person would bid, say, a higher royalty, develop it, and then say, oh, I cannot continue to operate at this level. And then he would come in and seek some modification of the terms and thereby, again, creating subjective considerations.

Senator GRAVEL. Maybe the royalty could be based upon some type of formula where capital is recovered off the top, or partially off the top, in a compromise situation.

That is, take a royalty income or percentage until the capital is recovered, and then a different percentage later when we are dealing all in profit—or, not necessarily profit, but in the return of capital. That might be worked out.

I appreciate your counsel in this area, and I think it has been valuable and certainly helpful to me.

Let me pursue other areas that we want to get something on. Of course, I believe you do agree with Professors MacEvoy and Pindyk who in November testified before us on the effects of deregulation, but this morning Chairman Nassikas told us that the FPC has a

51-cent-wellhead price on 200 billion cubic feet of gas, but that there was no evidence the higher price has brought on new supply.

How do you explain the apparent lack of production in response to the higher FPC prices?

Mr. HAMMOND. I was here this morning, and I heard the chairman testify. I think that what he meant was—he was responding to the suggestion that some have made that producers are holding gas off the market already developed, and just sitting there waiting for a higher price. What the chairman was saying is that the FPC adopted a rule under which you could make temporary sales at higher than the area price, and some have been approved up to 51 cents. But this had only elicited a relatively minor amount of gas that was not already being produced. And his suggestion was that if there had been any substantial amount of gas being held off the market waiting for a higher price it would have responded to this incentive that the Commission held out and more than this 150 million would have come forward.

I also think the chairman did say this morning that he had observed a response in drilling—that is, increased activity in both exploratory and development drilling for gas—and he attributes that to new policies by the Commission which have increased the price of gas over what it had been before.

Senator GRAVEL. I have asked Mr. Best to join me because I think the interpretation of Mr. Nassikas comment is very important, because one of the charges that is so accepted by everybody is that there is a conspiracy to hold some gas off the market. I was just asking Mr. Best if he agreed with your analysis of the Nassikas comment.

Mr. Best, would you prefer to give your interpretation?

Mr. BEST. I got part of that view, but it was my impression that the chairman was suggesting that there was indeed a shortage of supply, and that it was not a good policy just to have higher prices unless you could be sure there was going to be an add-on on the supply side. And I thought it was in that context that he mentioned the 51 cent price had not elicited any greater supply.

Senator GRAVEL. That agrees with his statement.

Mr. BEST. I do not know whether it was in the context of withholding from the market or in the context that it takes 3 to 5 years before price would be level with the supply, or what the reason was.

Senator GRAVEL. If you would like to introduce your colleagues who have joined you, then we can all participate.

Mr. HAMMOND. This is Mr. Rebman who is the chairman of our Legal Subcommittee of the Gas Supply Committee, and Mr. Johnson who is a member of that Legal Committee. Both of these gentlemen have labored in the vineyards for many years in this gas business, and I am very glad they came up here to lend their support.

I think we may be confusing two different things. First the Commission's 180-day emergency order permitted sales of gas in interstate commerce for a limited period, 6 months. And they would permit a higher price for that gas than they would have allowed under the area rate formula. Now, I believe the Commission said they had approved sales up to 51 cents.

Senator GRAVEL. This is all over the country?

Anybody can bid up as high as 51 cents and the Power Commission will approve. Right?

Mr. HAMMOND. But it is on an emergency 6-month basis. You cannot do that for more than 6 months.

Senator GRAVEL. So your contract would have to expire?

Mr. HAMMOND. It expires in 6 months and that is all the sale you have. So what the chairman was saying—

Senator GRAVEL. So it would not be such a big incentive to drill on that basis because you would only get a shortrun—

Mr. HAMMOND. That is right, so all that would do would be to elicit some temporary surplus supply in some location which might not otherwise have gone interstate.

So what the chairman was saying is that if there had been a lot of gas lying around just waiting to be produced, more would have responded to this temporary price increase.

Mr. VAUGHAN. Mr. Chairman, I think however there is tangible evidence that activity has responded to several factors and I mentioned two or three in my testimony. One is just the higher price of crude oil; stripper wells are being placed back on production. In the third quarter of 1973, drilling had picked up substantially over the prior period in 1972. In December of 1973, we had reached the highest level in drilling since 1965.

Now in the time element, and again in my testimony I indicated the long period of time between initiation of a project and production. Three to 5 years is the very minimum. This means that already there are responses to these price incentives, first because of the free market in intrastate because of, let us say, the leniency or the wisdom of the Federal Power Commission in allowing these higher rates, however temporary, and in the increased crude oil prices.

And I think we can look for a similar response as prices continue to climb, or if deregulation actually becomes effective, I do not think there is any question about it. Producers, as I indicated again in my testimony, are going to choose only those projects that they feel, under existing price conditions, can justifiably be chilled with a reasonable return in relation to the risk.

Each time that price goes up, marginal prospects come into being. They become and they will be drilled.

Senator GRAVEL. Sir?

Mr. JOHNSON. Mr. Chairman, I think there is one legal matter here which might bear on your deregulation proposal in connection with this. And that is that anything the Federal Power Commission tries to do—or almost anything—has been challenged in the courts.

And this particular provision, this 180-day order, was challenged in the courts. And the District of Columbia circuit issued a stay order which they refused to permit this order to take effect.

That was removed by the Supreme Court; but there is still pending in the District of Columbia circuit a challenge to the legal validity of this order. So, even though the Federal Power Commission wants to proceed in this manner, a producer is reluctant to rely on the validity of an order which is being challenged in the Court of Appeals and thereby the supply-eliciting feature of this, is pretty limited.

Senator GRAVEL. Very good, a very good point.

What do you estimate will be the wellhead price in the absence of controls? What do you think it will go to? Will it level out, or—

Mr. VAUGHAN. Well I think we have an example we can look at today, and that is the intrastate market where there is a free market.

And in the testimony this morning you recall prices of 75, 80, even to I believe \$1.25 were mentioned.

Now this is a free market. And if this is not typical of what you could expect under complete deregulation, at least it is a large sample. Here again, referring to your question about the comparison of crude prices compared to energy content in gas, even the price of \$1 Mcf would only be \$6 a barrel of oil. And certainly, looking at what the OPEC nations are doing to us today, even looking at the prices of what it may cost to develop liquids from coal or liquids from shale or so forth, even at \$1, it would seem to me to be an outright bargain.

So you do have at least that sample to look at.

Eventually, I would say that the price of gas is going to seek a level in the market competitive with nuclear power. It is going to seek a level in the market competitive with crude oil; competitive with coal; competitive with shale; with geothermal; with any other energies that can be developed.

I think this is the way the free market operates. To put a precise number on that at this time would be a real challenge because this is a dynamic industry and you are shooting at a moving target. Inflation is with us, as I recall, 8 percent last year, so that a guess today would not necessarily be valid a year from today.

But I think that in a competitive market you could expect the value of gas to assert itself in relation to alternative fuels. And certainly, again as I indicated in my testimony.

I think—in fact, I feel positive—that the price of that domestic gas is going to be less than any type of energy we can import.

Senator GRAVEL. Very good.

How much natural gas reserves are owned or controlled by major oil companies? Like, say, the 25 largest natural gas producers?

Mr. VAUGHAN. Mr. Chairman, that information is in the record and I think rather than try to recall it from memory, if you do not have it we could furnish it to you.

Senator GRAVEL. Would you, please? That would be how much is owned by the majors. How much percentage of the total gas in the country. And then what 25 percent of the largest gas companies represent the total market, their reserves, annual production, level of competence.

Mr. HAMMOND. That information is readily available, Mr. Chairman, we just do not have it here. But, with your permission, anything else that might come up here we would like to supplement the record with it.

[The following information was subsequently received for the record:]

GAS SUPPLY COMMITTEE,  
Washington, D.C., March 13, 1974.

Hon. MIKE GRAVEL,  
U.S. Senate,  
New Senate Office Building,  
Washington, D.C.

DEAR MIKE: In accordance with your request of January 24, 1974, at the hearing of the Energy Subcommittee, we have attempted to find the most current and accurate data regarding the sales and market share of the twenty-five largest natural gas producers. We have found that individual company data is not publicly available in such detail that figures for natural gas in the United States

could be broken out. Hence, we relied on the 1971 edition of the FPC report of *Sales by Producers of Natural Gas to Interstate Pipeline Companies* and the preliminary figures based on data compiled by the FPC for sales by producers of natural gas to interstate pipeline companies in 1972 which have not yet been officially published.

The volumes and revenues listed in these sources refer to interstate sales only. Further, these data attribute all deliveries from unitized operations and gas processing plants to the operator so that the volumes shown do not precisely correspond with a producer's net ownership sales volumes.

We used the FPC sales figures to calculate the market shares of the twenty-five largest interstate producers. In 1971, domestic producers sold a total of 13.7 tcf of natural gas, of which 73 percent, or 10.066 tcf was supplied by the top twenty-five producers. These figures can be compared with those relating to 1972 in which 14.7 tcf of natural gas was sold, of which 9.913 tcf or 67 percent was sold by the twenty-five largest producers, a decline of 6 percent.

Comparisons of the percentages for the top four, and the top eight producers also reveal declining market shares. The largest eight producers sold 6.231 tcf in 1971, which was 45 percent of the domestic interstate market, and 6.192 tcf in 1972, which was 42 percent of the market. The largest four producers sold 3.663 tcf in 1971, having 27 percent of the market, as compared to 3.608 tcf in 1972, or 24 percent of the market.

Please let us know if we can be of further assistance.

Sincerely,

KENNETH E. BELIEU.

Enclosures.

TABLE 1.—SALES BY PRODUCERS OF NATURAL GAS TO INTERSTATE PIPELINE COMPANIES, 1971, PRODUCERS WHOSE COMBINED SALES WERE 2,000,000 MCF OR MORE SALES VOLUME, HIGH TO LOW

Producer	Volume	Revenue amount
	(thousand cubic feet) 14.73 P.S.I.A. at 60° F	
Humble Oil & Refining Co.....	1,348,397,363	\$261,316,380
Shell Oil Co.....	783,669,305	149,160,111
Amoco Production Co.....	780,437,867	142,922,771
Gulf Oil Corp.....	751,012,391	142,779,049
Phillips Petroleum Co.....	724,194,133	130,098,105
Mobil Oil Corp.....	683,618,178	130,444,208
Texaco, Inc.....	609,816,756	121,725,198
Union Oil Co. of Calif.....	549,932,796	111,236,286
Atlantic Richfield Co.....	500,104,573	88,772,767
Continental Oil Co.....	466,236,273	92,209,423
California Co., Division Chevron.....	382,101,555	78,537,516
Alberta & SO Gas Co., Ltd.....	353,784,836	90,079,321
Sun Oil Co.....	337,661,363	66,536,906
Cities Service Oil Co.....	288,534,525	49,332,831
Tenneco Oil Co.....	275,904,183	51,435,990
Trans-Canada P.L., Ltd.....	259,678,320	83,020,732
Westcoast Trans. Co., Ltd.....	240,351,588	64,598,342
The Superior Oil Co.....	228,887,164	50,054,566
Pennzoil Producing Co.....	200,635,802	39,193,895
Skelly Oil Co.....	198,556,482	35,608,778
Getty Oil Co.....	168,362,631	34,916,871
Warren Petroleum Corp.....	134,651,724	24,582,544
Champlin Petroleum Co.....	133,825,392	20,609,518
Union Texas Petroleum Division Allied.....	127,207,712	23,395,686
Arathon Oil Co.....	124,365,715	21,781,350
Gen. American Oil Co. of Texas.....	90,557,095	19,289,285
Kerr-McGee Corp.....	90,045,757	18,829,146
Ashland Oil Inc.....	87,284,960	15,262,709

## PRELIMINARY SALES DATA FOR PRODUCERS TO INTERSTATE PIPELINE COMPANIES, 1971

Company	Production	Revenue
Exxon Co., United States.....	1,326,259,401	\$271,435,985
Gulf Oil Corp.....	791,584,264	155,594,667
Amoco.....	773,541,494	156,247,882
Shell Oil Co.....	716,825,673	146,917,843
Phillips Petroleum.....	702,503,315	132,579,356
Texaco, Inc.....	683,067,068	148,177,638
Mobil Oil Corp.....	642,329,394	129,134,768
Union Oil of California.....	556,764,790	119,804,656
Atlantic Richfield Co.....	547,773,851	106,901,609
California Chevron.....	354,456,233	74,908,267
Cities Service.....	347,570,270	66,607,336
Sun Oil Co.....	205,152,865	62,814,261
Continental Oil Co.....	268,274,523	52,758,469
Superior Oil Co.....	252,925,141	57,515,274
Tenneco Oil Co.....	239,751,829	51,502,112
Getty Oil Co.....	237,900,445	53,064,931
Skelly Oil Co.....	212,641,159	42,231,993
Pennzoil.....	211,146,930	44,638,629
Champlin Oil Co.....	120,975,750	18,911,546
Marathan Oil Co.....	115,383,676	22,628,240
Warren Petroleum (subsidiary of Gulf).....	115,143,603	21,313,807
Union Texas Petroleum.....	110,097,267	22,503,311
Ashland Oil Co.....	95,940,751	17,975,997
Kerr-McGee.....	94,218,526	20,929,291
Westbrook, B.H.....	91,209,900	17,424,539
Total industry (sales only).....	14,741,065,000	3,129,301,000

Note: Excluded are any importers of natural gas. These data are for domestic producers solely.

Senator GRAVEL. Very good, we will have it open for 10 days and if we get additional questions, we will query you on that also.

What do you think, as far as the potential supply of gas in the United States is concerned. Would you care to hazard a guess as to if we had a free market condition where realizing the desirability of gas and the proper pricing, what do you think the free market could bring forward to the people of this country, in quantity?

Mr. VAUGHAN. Well as we mentioned in our testimony, the Potential Gas Committee has estimated the potential supply amounts to something like 1,150 trillion cubic feet.

Now I think it is very important to be sure we are talking about "potential supply." We do not know where it is. You have to find it. You have to look for it. You have to develop it. But these are numbers that we think have some validity because the numbers were arrived at by a staff of geologists, engineers, and people who are most knowledgeable in the industry.

This Potential Gas Committee also has members from the Federal Power Commission and from the Department of the Interior and other governmental agencies. The U.S.G.S., on the other hand have estimated the potential reserves to be something larger than that, it seems to me, around 2,000 trillion cubic feet.

Bur you are in an area, an unknown area, relatively unknown area. On the other hand, I think there is some validity to it and my own feeling is that we will find at least that amount of gas, given the incentive to look for it.

Senator GRAVEL. Very good.

Well gentlemen, I think I have held you here long enough. I am very grateful, I know the committee is, for the views that you have put out and the work that you have done in preparation.

May I ask you one more question? One barrel of oil is 6 million British thermal units. What is one Mcf?

Mr. VAUGHAN. Are we talking about 1,000 cubic feet?

One Mcf?

Senator GRAVEL. Yes.

Mr. VAUGHAN. One million British thermal unit—we usually price gas per Mcf, it is so much easier to price it by Mcf, it is 1,000 cubic feet and that is 1 million British thermal units.

Senator GRAVEL. 1,000 cubic feet?

Mr. VAUGHAN. Or an Mcf, the same thing.

Senator GRAVEL. Ok, I have it now.

Thank you very much gentlemen, we appreciate it.

Mr. HAMMOND. Thank you, Mr. Chairman.

Senator GRAVEL. Our next witness is Mr. John Partridge, on behalf of the American Gas Association. Mr. Partridge?

It is a pleasure having you before us and I want to thank you on behalf of the committee and myself for taking your time to give us your counsel. And if you wish to be joined at the table by anybody who is with you, we would be happy to have them.

Mr. PARTRIDGE. I will try it on my own.

Senator GRAVEL. Very good, proceed then.

**STATEMENT OF JOHN PARTRIDGE, CHAIRMAN OF THE BOARD AND CHIEF EXECUTIVE OFFICER, COLUMBIA GAS SYSTEM, WILMINGTON, DEL., ON BEHALF OF THE AMERICAN GAS ASSOCIATION**

Mr. PARTRIDGE. Thank you, sir.

I have filed a statement, and I just propose to run through it and try to hit a few of the highlights, we are running short of time.

I will not go into what the American Gas Association says, that is covered by the statement. I do want to say that the current critical energy situation should at long last convince Congress and the American public that the United States is in a deepening energy crisis with serious effects on our Nation's welfare.

However, we are concerned that even with the necessary measures to provide partial and short-term help, there remains a tremendous undertaking to make the United States self-sufficient in adequate energy supplies. Until this is achieved, we will be increasingly dependent upon foreign supplies with increasingly perilous uncertainties. We face, in fact, a deepening long term problem that is certain to escalate with critical impact on our economy for at least a decade.

We are very pleased that S. 2806 proposes to aggressively attack this problem. We believe that two of its general objectives are of particular importance. They have to do with Federal energy research and development, and termination of price controls.

While there are many other actions that have to be promptly taken, the basic solution is the earliest possible implementation of a massive all-out Federal energy research and development demonstration program embodying full industry participation and organized, structured, and funded to insure the national capability for energy self-sufficiency as soon as possible.

This must be done on a high-urgency basis, such as took place with the successful Manhattan and NASA programs. The urgency and importance of this program mandates the essential criteria, against which proposed legislation should be measured.

One, the program must be conducted by a fresh, new organization, independent of existing entities, priorities, and procedures, pulling together the present fragmented Federal energy research efforts, charged with overall and specific accountability for meaningful results, and reporting directly to the President.

It is essential that this program be subject to the least restraints possible, including partisan and political. It must involve an independent effort by our best talent to do the job that must be done.

The organization should accordingly be single purpose and mission oriented, with coordinating authority and overall policy control of all pertinent existing Federal civilian energy research activities, such as those in the Atomic Energy Commission, the Department of Interior, and all others needed to enable the agency to actually provide a national capability for energy self-sufficiency.

The organization, scope, and management structure of the Federal Energy Administration proposed in title III of S. 2806, do not meet these criteria. However, S. 2694, a bill introduced by Senator Cook, proposes an organization more responsible to the need.

It provides for an R. & D. administration to which would be transferred all civilian energy R. & D. functions and programs of the AEC, of the Interior Department, and all other Federal departments or agencies which, in the Administrator's judgment, are necessary or appropriate for it to fulfill its responsibilities, and it gives the Administrator authority to review and coordinate all other Federal energy R. & D. functions and programs.

Two, the Administration must be funded on a sustained basis, a trust fund which would provide ample financial resources for at least 10 years. This is essential so that needed funds can be utilized without any timelag, and that long-range commitments can be readily made and implemented with continuity. The usual year-to-year authorization and appropriations procedure could severely retard proper progress of the program.

The provisions of title II of S. 2806 to establish an energy trust fund financed by a tax on energy sources meet this criteria.

The average tax rate over the 11 years is about 4.7 cents per 1,000 cubic feet which would result in an increase of approximately \$6.22 per year to the average residential gas consumer. There can be no question but that consumers will be far better off paying this small increase since it is to be used to help assure the Nation of adequate supplies of energy.

We strongly support the basic trust fund concept, but are concerned that sections 201(3)(1) and 308(a) seem to contemplate that before the Administrator can actually spend moneys in the trust fund, he will have to obtain approval from the Appropriations Committees.

The resultant prospect of delay, tempered by political consideration, threatens to jeopardize the urgently needed continuity of funding and program development.

Three, the Administration must have maximum flexibility to function at its management discretion within broad policy guidelines. Its management and responsibility should be vested in an Administrator with an advisory council. The council should consist of key Government officials with primary responsibilities in areas related to energy and persons from the private sector with high qualifications and



responsibilities in energy and relevant areas, appointed by the President with the advice and consent of the Senate.

We strongly urge this type of organization rather than that proposed in titles III and IV of S. 2806.

These criteria are requisite if the United States is to become self-sufficient in adequate energy as soon as possible. Attached and marked appendix A is a draft of a bill which incorporates what we consider the best features of various Federal energy research and development bills. We urge your adoption or incorporation of it as part of S. 2806.

The second major point has to do with termination of price controls, title V, it has to do with natural gas deregulation.

In general, A.G.A. supports the provisions of section 502 on Natural Gas Deregulation. However, following deregulation of producers, price levels will rise substantially as they must if the domestic exploration for natural gas is to expand dramatically as the public interest demands it should.

And if there is not some workable statutory guideline as to what would be deemed in the public interest, we are concerned that all of the controversies, issues and delays of producer regulation will simply be transferred over to pipeline certificate delay cases with the same depressing effects on bringing forth new natural gas supplies which producer regulation has had over the years.

Therefore, it is A.G.A.'s position that the interstate pipeline should be entitled to uncontested approval of its purchased gas costs so long as the full purchase price does not exceed a specific economic index based on the prices paid for alternate sources of energy. A.G.A. is investigating such an index and we will apprise the committee of our recommendations as soon as possible.

Our comments regarding certain other parts of—

Senator GRAVEL. Excuse me, Mr. Partridge. Does that index presently exist?

Mr. PARTRIDGE. No, sir, as I say we are attempting to develop one and just as soon as we have some results—

Senator GRAVEL. In what time frame do you think you might have this index worked out? How long do you think it would take before you have it in hand, or we could be made privy to it?

Mr. PARTRIDGE. I would hope to have something within the next 2 weeks.

Senator GRAVEL. If you could submit that for the record as soon as you get it, we will incorporate it. I think it would be very valuable and a very, very important thing to have in hand.

Mr. PARTRIDGE. Thank you.\*

Our comments regarding other parts of S. 2806 are:

We are opposed to the statutory limitations proposed in title VII on imports of energy, at least until the Nation has attained energy self-sufficiency. To do otherwise, could deprive the Nation of badly needed supplies during this period of shortages. The President should have the authority to decide which imports of energy are not in the national interest.

We support the objective of relaxing import controls on certain steel drilling and mining equipment.

\*The Committee was informed on March 15, 1974, the witness was still studying development of an economic index and results would be forwarded to the Committee upon completion.

Senator GRAVEL. Excuse me?

What do you mean by The President should have the authority to decide?

Mr. PARTRIDGE. In connection with the importation of energy, we are saying that rather than put a—I believe there is a 5-percent figure on the Arab countries—we are saying that it should be up to the President to decide whether it should be 0 or 5 or 10, depending upon what the Nation's requirements are and how it affects the national security.

Senator GRAVEL. Very good, thank you. I think that is an improvement over our bill, too.

Mr. PARTRIDGE. Thank you.

We support the objectives having to do with export limitations, but believe the implementing authority should be vested in the President or the top Administration office or officers on energy policy rather than the Secretary of Commerce and the Secretary of Interior.

Another very important item, we believe that eventually when natural gas attains its true market value through deregulation and gas supply and demand is brought reasonably into balance, there will be no need for special tax incentives.

However, it should be emphasized that the natural gas industry is now making huge capital expenditures and will have to continue to do so for a long time in the future if it is to obtain adequate supplies.

Therefore, it is most important that efforts be made to increase cash flow and to strengthen the financing abilities of the natural gas industry. The provisions of title IX, tax incentives, could help, particularly section 902 as it relates to R. & D. operations, but the major assistance would be deregulation and proper weight by regulatory commissions to current financing problems in rate determinations.

We oppose the provisions of title X which would remove foreign percentage depletion and intangible drilling and development cost deductions. The energy shortage is world wide. And every Btu of energy developed throughout the world will indirectly or directly ease the situation in the United States.

But most important, elimination of these deductions could hamper large exploratory programs in foreign countries, particularly Canada which it is hoped will result in deliveries of energy to the United States.

We support the proposed credit or deduction for residential energy conservation expenditures.

I believe those are pretty much the highlights of my formal testimony.

Senator GRAVEL. I, for one, deeply appreciate the amount of support that your statement contains for the trust fund, and of course, the concept of the British thermal unit tax. We have had a hard time washing that tax with industry and even with the Administration this morning.

I am sure you realize that what this does is take an element of discrimination away from your industry.

For some reason, everybody seems to want to tax the fossil fuel area, and forget about hydro and other areas which render energy.

Would you have any comment at all about the statement that a British thermal unit tax would discriminate against gas and coal? Or

against coal and low-gravity oil, I think that was the fear. I think it is a fear, but maybe it is real?

Mr. PARTRIDGE. Well, let me start by saying that I do not think you are ever going to come up with a perfect formula of this kind, and there is not any question this could discriminate against the lower-cost forms of energy such as gas and coal, as opposed to the higher-price forms such as oil.

Senator GRAVEL. Well, gas is lower cost only because it is artificially kept there. If it got to its proper form in the priority of values, that is, it is the best form of energy so therefore we should be paying the best price for it, it is just the opposite by a factor of six.

Mr. PARTRIDGE. And then it will not be discriminated against by such a tax when it reaches its proper value.

Senator GRAVEL. You just gave us the answer. That is right.

Mr. PARTRIDGE. Yes, sir. But again I do not think the impact, the amount of the tax even though you can theoretically say it discriminates or does this or does that, I do not think the impact is going to be that great on the ultimate consumer in any event.

It is a good, sound tax we think.

Senator GRAVEL. Thank you.

You can do some lobbying on your colleagues in the industry on that subject because we will need the help if we are going to get this equity.

Mr. PARTRIDGE. We are going to work on it.

Senator GRAVEL. Do you have any questions, Mr. Best?

Mr. BEST. I think I have just two or three.

I think you recognize, in your statement, that there was a period of uncertainty if we went to the deregulation because world prices of oil could set such a high umbrella over domestic prices that no one would quite know what the equilibrium price would be on any short term.

And there is a danger that if the prices just took off completely it would trigger in an adverse reaction which would then perhaps lead to further regulation down the road.

Do you feel that there is sufficient awareness of this possibility within the industry so that whatever price increase would occur, assuming total deregulation, would be graduated and moderate rather than escalating at such a rate that would trigger in such a reaction?

I notice you have some suggestion in your bill—in your statement—which recognizes this, and I was not quite clear.

Mr. PARTRIDGE. Well this is the reason we are proposing this "index" or "ceiling." In other words, if we arrive at a formula—if you gentlemen would legislate a ceiling that can be paid at the wellhead, and let us say that that ceiling is \$1, then that means that that is the ceiling and no one can pay anymore than that if they want FPC to approve the rates or if the producer wants to be exempt.

And I think this would take care of what you are talking about which is runaway bidding for example, which we have great concern about. But we think it is—

Senator GRAVEL. But would that apply to oil, too?

Obviously it would have to, would it not?

Mr. PARTRIDGE. No—well we are just concerned ourselves with gas.

Senator GRAVEL. I appreciate that—but the concern I have is if it is worth regulating gas, then regulate crude oil, too. If we are not going to do one, let us not do the other. I think we have reached a

situation now in the country where we can correct the problem of regulating one and not regulating the other.

But please explain to me again, your index and how you think it would work. I think I may have some problems with that.

Mr. PARTRIDGE. We are trying to develop an index which would relate the wellhead price of natural gas to its true market value as compared with alternate forms of fuel.

Senator GRAVEL. Which would be oil; which would be hydro; which would be atomic; all the various—

Mr. PARTRIDGE. Electricity, it could be, for example, one way to do it would be just to tie it to the price of crude. Now that would have an approach as true market value, but—

Senator GRAVEL. That is what I was trying to do earlier with the 1-to-6 ratio, which I now understand. I think that is very valuable because it shows you what you are doing in terms of value and what public policy has done.

Mr. PARTRIDGE. Well, this is what should have happened to natural gas a long time ago. If such a thing as this had taken place instead of the *Phillips* decision, I do not think this country would be in the energy shortage it is now.

But this is how—

Senator GRAVEL. One of the thoughts, it was just mentioned a little bit by our earlier witnesses, is that the actual change in price at the wellhead, because of the large infrastructural cost that is in place right now, would have a 12 percent—and I am just groping, I do not recall the figure, maybe you could correct me?

Mr. PARTRIDGE. Seventeen.

Senator GRAVEL. Seventeen percent to the consumer in his price increase. So what would that be? One hundred percent increase at the wellhead would have a 17 percent increase to the consumer? Is that the ratio?

Mr. PARTRIDGE. The average for the Nation, as I understand, is that 17 percent of the price that he pays is the cost of gas at the wellhead.

Senator GRAVEL. So that 83 percent is the capital installation to bring it from the wellhead to his burner in his kitchen?

Mr. PARTRIDGE. Exactly. That is right, 83 percent.

And of course those costs are thoroughly regulated by the Federal Power Commission and the State commission.

Senator GRAVEL. It should be, because I know once you lay down the pipe you change the economics within an area so it is a different set of conditions, and I do not feel that that part of it should be deregulated.

There is a uniqueness—

Mr. PARTRIDGE. That is right.

Senator GRAVEL [continuing]. But in front of that 83 percent, that 17 percent which is where our 10,000 gas drillers are located competing with one another to get their product to market, is where there is competition and where we should not have any regulation, as I view it. Is that the signal?

Mr. PARTRIDGE. I am not sure I understood that.

Senator GRAVEL. What I am saying is, the supply at the wellhead should not be regulated.

Mr. PARTRIDGE. Right.

Senator GRAVEL. Because there is competition and we get the best of both worlds through the fair price system.

Mr. PARTRIDGE. Right.

Senator GRAVEL. But from that 83 percent, backwards to the customer, there is not the element of competition and that is the reason we have to have regulation, in order to guarantee that the responsibility goes along with the monopoly, and is exercised intelligently.

Mr. PARTRIDGE. Well this has not always been the case.

I mean prior to the shortages, we did have competition from oil and electric and so forth. We are not a monopoly by any means.

Senator GRAVEL. Well they are if the price is artificially kept low.

Mr. PARTRIDGE. That is right.

Senator GRAVEL. So it would be an interesting thing to see what would happen if you totally deregulated and had real competition between the various types of energy, and then if true alternatives were readily available, and certainly oil has a greater mobility than gas, then perhaps there could be some future change to deregulate other aspects of it, if it did arrive at a free market.

That is very interesting. I had not thought of that.

Mr. PARTRIDGE. There is one other factor, Mr. Chairman, I would like to mention along the lines we are discussing now.

We are only advocating deregulation of new contracts after, let us say, April 15, 1973.

Senator GRAVEL. Excuse me sir. Why not—and I am sure you understand it is only a proposal, of course your colleagues ahead of you testified similarly except that they preferred to go back 4 years.

Mr. PARTRIDGE. Gradual phaseout, yes.

Senator GRAVEL. But if all of these are individual contracts, and we wipe out, any existing clause that increases the rates automatically if there is no regulation, and we honor the sanctity of the contracts, since we are only talking about 17 percent, would there not be only a small impact on price in deregulating everything at once? The only effect that would come from old gas would be as these contracts are retired and new ones are negotiated. That would have sort of a reciprocal effect, would it not? And, since we are only dealing with the 17 percent that would be the impact on price, then deregulating the whole thing would not seem to be that dangerous a situation, marketwise or pricewise, to the consumer?

Mr. PARTRIDGE. No, I am afraid it works the other way because all of the gas we are getting now, or most all of it you might say, is under old contracts.

Senator GRAVEL. But they all expire at different times, do they not?

Mr. PARTRIDGE. That is right, and we feel that they should be allowed to run the course that the contract terms provide for which will result in a gradual impact on the consumer.

Senator GRAVEL. We agree, that is what I was trying to say, I do not think I said it properly, though. I think I was coming at it backwards, but that is exactly what I meant.

Mr. PARTRIDGE. And that was the point I was trying to make; this is another factor not only is there 17 percent of the price impacted on the consumer, but the fact that you will have this gradual roll-in over a number of years is going to, again make the impact on the consumer gradual over these periods of years.

Senator GRAVEL. Exactly, I could not agree more.

So our conclusion is that if we deregulate all gas and guarantee the sanctity of contract, these contracts will be the self-releasing mechanisms, through this roll-in process, assuring that you will not have an exaggerated price reaction as a result of deregulation. Is that a fair statement?

Mr. PARTRIDGE. I have a little problem differentiating between deregulating all gas and sanctity of contract.

Senator GRAVEL. Well, the problem may be mine because I may not understand the full ramifications within the industry of the idea of sanctity of contract. What I mean is that if somebody has a contract with a utility to supply gas for the next 5 years at  $X$  price which has been approved by the FPC, that utility will continue to exercise the contract—

Mr. PARTRIDGE. We are talking about the same thing.

Senator GRAVEL. Until it retires itself. The contract expires, and they renegotiate it for more supply. If they need more supply, the utility can negotiate another contract for additional quantities any where in the country. It makes no difference. But for the contract that is there, we will honor the sanctity of it and not let them break it. We will force both sides to live up to that contract, and so that is how we cushion in the deregulation process to the people.

Mr. PARTRIDGE. Very good.

Senator GRAVEL. We both agree exactly on the concept. Is there anything that has been done to substantiate this mechanism that we could have for the record? We have only discussed it verbally, though I have done it with others. If we could put some numbers together—

Mr. PARTRIDGE. The problem is in estimating how much new gas is going to come in over the next 5 years.

Now, we will be glad to work out—

Senator GRAVEL. No. I am just talking about the existing contracts, and their rate of expiration.

Mr. PARTRIDGE. Oh, I see.

Senator GRAVEL. I think we should talk about old gas, because we both agree that that is not going to have an appreciable effect on the marketplace, and I think in fairness we ought to talk about old gas.

Mr. PARTRIDGE. I agree.

Senator GRAVEL. Because if a guy has got a field and has committed part of it for 5 years, he should not have to be locked in on that field for 20 years at that price. He should be freed, because he is the person we want to look for more gas, because he has had more experience at it.

Mr. PARTRIDGE. Right.

Senator GRAVEL. So if we could get some arithmetic to back up your thesis and my thesis now, I think that we would be doing a good service to the informational process in developing policy.

Mr. PARTRIDGE. Let us see if we can work something up.

Senator GRAVEL. Mr. Best has got one more point.

Mr. BEST. Let me just pursue one thing with you for a few minutes.

Chairman Nassikas put in a very interesting table that appears in his statement, which would lead one to conclude that my Irish friends in Boston are going to become quite dependent on Algerian gas if these pending applications with the FPC are approved. And I just looked at the price on these applications, and I see they range anywhere from \$1.14 to \$2 per thousand cubic feet, which is three or four

times, I think, what the delivered price of Louisiana gas would be in the Boston area.

Is that about right?

Mr. PARTRIDGE. At least. Yes.

Mr. BEST. So that is it fair to conclude that the reason that Boston and Providence and Lowell, Mass. area are becoming dependent upon Algerian, Libyan, and some Canadian gas is directly related to the shortage which is directly associated with price regulation?

Mr. PARTRIDGE. Yes; I think that is a fair statement. Again, we are just running short. The shortages are getting larger every year, and we have got to get the gas from any source we can to tide us over.

Mr. BEST. Well, as the shortages are created then, there is incentive for the oil companies or the gas companies to get gas wherever they can—Algeria, the Soviet Union, Libya or Canada.

Mr. PARTRIDGE. Yes.

Mr. BEST. Now, having made that commitment of money though to get that gas would these companies—what would happen if the shortage ended? What would we do with that gas at \$1.50 per thousand cubic feet.

Mr. PARTRIDGE. We would have to continue taking it for the life of the contract. My company has a contract for Algerian gas for 20 years.

Senator GRAVEL. What company is that?

Mr. PARTRIDGE. Columbia Gas. And we are just tickled to death because that is the only thing we see in sight for the next 3 years for any relief at all.

Mr. BEST. Well, there is deregulation. Are you not confident that the supply would not come on? In other words, you made a 20-year investment in Algerian gas on the assumption that regulation would continue the gas shortage?

Mr. PARTRIDGE. No. It is the only way you can get it within reasonable economic limits at all. You have tremendous capital expenditures—the liquefaction plant, the tankers, the gasification plant. If you try to write that off in 5 or 10 years, then you would really have some high costs.

And again, it is just going to be a part of the supply; that hopefully we will not need it 10 years from now. But the way things are going we are going to be awfully glad we have it; and I am not even sure it would not apply to 20 years.

Senator GRAVEL. Could I expand upon that? Columbia owns the cryogenic tankers?

Mr. PARTRIDGE. No, sir, we do not. That is El Paso.

Senator GRAVEL. Oh, that's right, we got into a discussion with them, and they told us. That would mean that if the economics changed drastically, and we could deregulate gas and begin to supply our domestic needs, then your company is stuck with supplying the people of one area with gas at an excessive cost in relation to what domestic supplies would be. This then becomes an economic aberration, which is a product of not having supplies visible. That is why you did it now.

But if we correct it, the people within your market area will continue paying the price of past governmental bad policy, so to speak. Is that a correct statement?

Mr. PARTRIDGE. Well, yes. But I do not think the impact is going to be that much, because now, for example, all we are getting of the

Algerian gas is about 300 million cubic feet a day as compared to our average send-out of better than two billion cubic feet a day.

Now, if you roll in that Algerian price—and I think our latest estimate of that gas is going to be about 90 cents—if you roll that in—

Senator GRAVEL. Your latest estimate? I thought the filing before the FPC was \$1.35.

Mr. PARTRIDGE. No. You are talking about the Boston. This is the El Paso project which has been—

Senator GRAVEL. Well, in fact I did not know about the Boston deal until this morning, but I knew about your deal as a result of my dealings with El Paso.

Mr. PARTRIDGE. It turns out that our deal, which at the time the FPC and everybody else said you are crazy to pay this kind of money for this, it turns out that we are getting a bargain.

But I want to get back to my—

Senator GRAVEL. I assume so, if it is going to come in at 90 cents. That is what you are telling me; 90 cents is what you are estimating it will be.

Mr. PARTRIDGE. Something in that area, yes. But I want to get back to the point that by rolling that really small amount of gas into our overall sales, we cannot find it.

Senator GRAVEL. Now, I appreciate that. I am surprised at that. That really makes our gas look awfully attractive, too.

Mr. PARTRIDGE. Exactly, exactly.

Senator GRAVEL. Even rolling it in and realizing peaking abilities, the flexibility you have for handling peaking, makes it in fact a good roll in. It is probably desirable for the system to have that little extra flexibility without having it all in the pipes strung across the country or the company.

Mr. PARTRIDGE. If I can just take a minute, I think I have got to tell the hamburger story.

Senator GRAVEL. Please, please.

Mr. PARTRIDGE. That is about the lady that went into the butcher and ordered a pound of hamburger, and she said how much is it, and he said \$1 a pound. And she said, well, my goodness, Mr. Shultz down the street has a big sign in his window 50 cents a pound. And he said, well, why do you not go down there and buy it there? And she said, he does not have any.

Senator GRAVEL. The chairman of our committee would claim a proprietary—

Mr. PARTRIDGE. I am sorry, but this is the situation.

Senator GRAVEL. It says it very cogently.

Mr. PARTRIDGE. That is the only relief we can see in sight for at least 2 to 3 years.

Senator GRAVEL. The Algerian?

Mr. PARTRIDGE. Yes. It is going to be very valuable to us, even if it appears to stick our customers. I hope we develop enough domestic capacity that it makes us look bad; although I feel confident that before we are through the price of domestic gas is going to be higher than that.

Senator GRAVEL. Thank you.

Mr. BEST. That Algerian gas was not cut off during the embargo? The Algerian gas is still coming in to the country?

Mr. PARTRIDGE. No. The delivery is not expected until 1976, late in 1976.



Senator GRAVEL. Do they not have a cryogenic plant that is on——

Mr. PARTRIDGE. Oh, yes, but these are small shiploads and so forth coming in into New York Harbor and the Boston area.

Senator GRAVEL. And that was from their original plant?

Mr. PARTRIDGE. Right.

Senator GRAVEL. In fact, they had the first plant in the world and we had the second plant in Keynine, is that correct, and now the third plant, major plant, is in Algeria again, and they are about to supply additional supplies, are they not?

Mr. PARTRIDGE. They have been. There has been Algerian LNG coming to this country for some time but small quantities. Our total project, the El Paso total project is for a billion cubic feet equivalent a day.

Senator GRAVEL. There was no embargo on these smaller quantities that you know of?

Mr. PARTRIDGE. No. There was evidently a coincidence——

Senator GRAVEL. A plant shutdown or something like that?

Mr. PARTRIDGE. Yes. The Algerians swear that this is not part of the embargo.

Senator GRAVEL. Very good.

Thank you very much, Mr. Partridge.

We will recess the hearings until——

Mr. REBMAN. Mr. Chairman, John Rebman, Gas Supply Committee.

The questions that you and Mr. Best addressed to Mr. Partridge with respect to the impact of the various price changes in the field on consumers of gas, this question was addressed in a very detailed fashion before the Commerce Committee.

We would like to provide to you for the record a copy of the study which we provided to the Commerce Committee.

Senator GRAVEL. We are very happy to have it, and we will provide it for the record.\*

Mr. PARTRIDGE. And I will get a copy and see if I agree with it.

Senator GRAVEL. Very good.

Gentlemen, the hearings are recessed, and I have a vote.

Thank you very much.

[The prepared statement of Mr. Partridge and the summary referred to follows:]

PREPARED STATEMENT OF JOHN PARTRIDGE, CHAIRMAN OF THE BOARD AND CHIEF EXECUTIVE OFFICER COLUMBIA GAS SYSTEM, WILMINGTON, DEL., ON BEHALF OF THE AMERICAN GAS ASSOCIATION

#### SUMMARY

The attached testimony of the American Gas Association concerning S. 2806 makes the following recommendations:

(1) It supports the proposed trust fund and related excise tax on energy sources as providing the sustained funding of energy research and development programs indispensable to the national goal of developing the capability for energy self-sufficiency.

(2) It urges the establishment of a broad-based, mission-oriented and single purpose Federal Energy Research and Development Administration accountable for coordinating, initiating, and managing all Federal civilian energy and research and development programs, including demonstration programs.

(3) It urges that such Administration be headed by a single Administrator who

\*The study was received and made a part of the official files of the Committee.

shall consult regularly with a select Advisory Council consisting of eight government officials qualified in the field of energy and energy research and development, and seven experts from the private sector appointed by the President with the advice and consent of the Senate.

(4) It supports deregulation of "new" gas subject to price ceilings determined by a specific economic index based on the price paid for alternate sources of energy.

(5) It opposes the proposed statutory limitations on the import of energy as self-defeating but it supports export limitations as to which, however, for purposes of flexibility, it suggests that implementing authority be vested in the President or in the top officer in the Administration on energy policy.

(6) It says special tax incentives will not be needed after natural gas attains its true market value through deregulation and when supply and demand are reasonably in balance, provided the regulatory agencies recognize in their rate determinations the financial criteria required for the huge capital expenditures energy companies will have to make to provide needed energy.

(7) It opposes the removal of foreign energy depletion and intangible drilling and development costs deduction on grounds that the energy shortage is worldwide and makes every Btu of energy needed, that directly or indirectly every Btu produced helps this country, and that elimination of these deductions could hamper large exploratory programs in foreign countries, particularly Canada, which it is hoped will result in deliveries of energy to the United States.

(8) It opposes as unnecessary the proposal that the Secretary of Interior have authority to increase rates of production.

#### STATEMENT

This statement is presented on behalf of the American Gas Association and the Columbia Gas System.

The American Gas Association is a national industry association composed of some 300 distribution and transmission companies which deliver about 92% of the utility natural gas consumed by 150 million people in this nation. Natural gas provides about 31% of the nation's total energy requirements and 42% of its stationary energy needs. The Columbia Gas System directly at retail and indirectly at wholesale provides gas service to 4 million customers in an area with a population of some 18 million people in the seven states of Kentucky, Maryland, Ohio, Pennsylvania, New York, Virginia, and West Virginia, as well as the District of Columbia.

Although natural gas is of prime interest, meaningful and appropriate efforts are essential to provide our nation with adequate supplies of all forms of energy. There is need and room for all.

The current critical energy situation should at long last convince Congress and the American public that the United States is in a deepening energy crisis with serious effects on our nation's welfare. However, we are concerned that even with the necessary measure to provide partial and short-term help, there remains a tremendous undertaking to make the United States self-sufficient in adequate energy supplies. Until this is achieved, we will be increasingly dependent upon foreign supplies with increasingly perilous uncertainties. We face, in fact, a deepening long-term problem that is certain to escalate with critical impact on our economy for *at least* a decade.

S. 2806 proposes to aggressively attack this problem and we believe that two of its general objectives are of particular importance. They have to do with (a) Federal Energy Research and Development and (b) Termination of Price Controls.

#### *A. Federal Energy Research and Development*

While there are many other actions that have to be promptly taken, the basic solution is the earliest possible implementation of a massive all-out Federal energy research and development demonstration program, embodying full industry participation, and organized, structured and funded to insure the national capability for energy self-sufficiency as soon as possible. This must be done on a high urgency basis—such as took place with the successful Manhattan and NASA programs. The urgency and importance of this program mandates the essential criteria, against which proposed legislation should be measured.

1. The program must be conducted by a fresh new organization, independent of existing entities, priorities and procedures, pulling together the present fragmented Federal energy research efforts, charged with overall and specific accountability for meaningful results, and reporting directly to the President. It is essential that this program be subject to the least restraints possible, including

partisan and political—it must involve an independent effort by our best talent to do the job that must be done. The organization should accordingly be single-purpose and mission-oriented—with coordinating authority and overall policy control of all pertinent existing Federal civilian energy research activities, such as those in the Atomic Energy Commission, the Department of Interior, and all others needed to enable the agency to actually provide a national capability for energy self-sufficiency.

The organization, scope, and management structure of the “Federal Energy Administration” proposed in Title III of S. 2806 do not meet these criteria. The civilian energy R&D functions of the AEC are the only energy R&D functions actually transferred to the FEA. The provision for possible additional transfers during the next 30 months unnecessarily delays basic decisions already too long delayed. The R&D agency would be AEC-oriented rather than a broad based, mission-oriented R&D Administration.

S. 2694, a bill introduced by Senator Cook, proposes an organization more responsible to the need; it provides for an R&D Administration to which would be transferred all civilian energy R&D functions and programs of the Atomic Energy Commission, of the Interior Department, and all other Federal departments or agencies which in the Administrator’s judgment are necessary or appropriate for it to fulfill its responsibilities, and it gives the Administrator authority to review and coordinate all other Federal energy R&D functions and programs. Such an inclusive transfer provision is essential if the agency is to achieve the success achieved by the mission-oriented NASA.

2. The Administration must be funded on a sustained basis—a trust fund which would provide ample financial resources for at least ten years. This is essential so that needed funds can be utilized without any time lag, and that long-range commitments can be readily made and implemented with continuity. The usual year-to-year authorization and appropriations procedure could severely retard proper progress of the program.

The provisions of Title II of S. 2806 to establish an Energy Trust Fund financed by a Tax on Energy Sources meet this criteria.

Financing the fund through a Btu tax on those who extract or import oil, gas, or coal, or who produce electricity using any other source, is effective and appropriate. The producers of energy would initially pay the tax at the source of the energy, but ultimately all energy consumers would pay for the cost of developing new energy sources for their future use.

The impact of the tax rates on consumers (starting for the one-year period beginning July 1, 1974 at 4.1 cents per million Btu content, or Btu content equivalent, rising to 6.5 cents for the one-year period beginning July 1, 1978, and declining to 2.8 cents for the tenth year, beginning July 1, 1984) would be slight.

The average tax rate over the eleven years is about 4.7¢/Mcf which would result in an increase of approximately \$6.22 per year to the average residential gas consumer.<sup>1</sup> There can be no question but that consumers will be far better off paying this small increase since it is to be used to help assure the nation of adequate supplies of energy.

We strongly support the basic trust fund concept, but are concerned that Sections 201 (e) (1) and 308 (a) seem to contemplate that before the Administrator can actually spend moneys in the trust fund, he will have to obtain approval from the Appropriations Committees. The resultant prospect of delay, tempered by political consideration, threatens to jeopardize the urgently needed continuity of funding and program development.

With the right management structure (covered under “3” following), the spending limitations above would be unnecessary; the Administration would have the expertise properly to plan its program and promptly to implement it with appropriate disbursements, and it would also have internal safeguards needed to insure against abuse of responsibility.

It will have to report fully and regularly to the Congress on all facets of the Administration’s operations, including expenditures, and that should be a sufficient Congressional safeguard.

<sup>1</sup> Total sales to residential natural gas consumers in 1972 (Mcf).....	5, 276, 839, 000
Total number of residential customers.....	39, 835, 000
Average usage by residential customers.....	5, 276, 839, 000

39, 835, 000

Or 133 Mcf/Customer times 4.7 cents per Mcf (average rate of tax)=\$6.22 per year per residential customer.

3. The Administration must have maximum flexibility to function at its management's discretion within broad policy guidelines. It must operate on a sound businesslike basis with sole authority to initiate projects of its own, by others, or jointly, and most important, must be able to timely terminate or cut back projects if lack of progress so dictates. Its management and responsibility should be vested in an Administrator with an Advisory Council. The Council should consist of key government officials with primary responsibilities in areas related to energy and persons from the private sector with high qualifications and responsibilities in energy and relevant areas, appointed by the President with the advice and consent of the Senate.

We strongly urge this type of organization rather than that proposed in Titles III and IV of S. 2806. The proposed 22-member Commission on Energy Technology Assessment is so large it would invite indecision and its substantial powers would make it virtually a competitor of the Administrator.

It is given independent powers of subpoena, of "keeping the public informed", of undertaking additional activities as it deems necessary, of contracting for outside services and acquiring property, of submitting its own annual report, and of having its own (substantial) appropriations. We cannot conceive of NASA having been so successful had it been so encumbered, and the need for a successful and therefore unencumbered R&D agency is more imperative. If the Administration is to be effective, it cannot be subject to a built-in adversary relationship, implicit in the extensive and competing powers of the proposed Commission.

An Advisory Council would add depth of knowledge to the Administrator's capability by consulting with and advising him in regular meetings on all important matters affecting the Administration, including assistance in the areas of technical and economic assessment, budgetary planning and overall policy, and it would also provide needed assistance and safeguards against Administration abuses, without being in competition with the Administrator.

These criteria are requisite if the United States is to become self-sufficient in adequate energy as soon as possible. Attached and marked Appendix A is draft of a bill which incorporates what we consider the best features of various Federal Energy Research and Development bills. We urge your adoption or incorporation of it as part of S. 2806.

#### *B. Termination of Price Controls*

The second major objective of extreme importance in S. 2806 is Title V—Termination of Price Controls—Natural Gas Deregulation.

In general, A.G.A. supports the provisions of Section 502 on Natural Gas Deregulation. A.G.A. has for five years urged major changes in Federal regulatory policies to stimulate exploration and development of new supplies of natural gas in the United States. The changes have not been forthcoming and the intolerably adverse supply demand trends have continued. The shortage of our universally acknowledged premium fuel grows steadily worse. Meanwhile, the nation's residential, commercial and industrial consumers must pay higher prices for less desirable forms of energy. This is occurring despite a tremendous resource base of potential gas supplies, which, with reasonable incentives, could make their rightful contribution to our nation's environmental and economic goals.

This situation is the result in large part of court decisions and due process requirements under a statute never intended for producer regulation. Accordingly, A.G.A. believes that the unfortunate 19-year experiment must be ended and, therefore, we support amendments to the Natural Gas Act which deregulate the wellhead prices of new gas.

As to certain specific provisions of Section 502, we offer the following comments:

Section 502 (d) would amend Section 3 of the Natural Gas Act so as to remove the Federal Power Commission's jurisdiction over the importation of natural gas. A.G.A. is opposed to this provision. Even if formal import approval is removed from the FPC, that Commission would still retain Section 7 Certificate and Section 4 and 5 Rate Making authority over the imports of both LNG and pipeline gas. Thus the Executive Branch and the FPC would both have to approve such projects, compounding the problems in a process already made complicated and time consuming. While there are foreign policy and national defense issues involved in any major import project, the views of the Department of State and Defense can certainly continue to be made known in the FPC proceedings as they are now.

Section 502 (e) and (f) would amend Sections 4 (e) and 5 (a) of the Natural Gas Act so as to preclude the Commission from denying in whole, or in part,

pipeline purchases of gas exempt under Section 1(b), except as to pipeline affiliate purchases which exceed those received from non-affiliates. This gives A. G. A. some concern. While we thoroughly support the concept that a regulated transmission company should be entitled to recover its full gas purchase costs—as should distribution companies in their regulation by state commissions—A. G. A., representing both distribution and transmission companies sees in this language the basis for opposition to such automatic flow through sufficient to threaten the field price deregulation goals.

On the other hand, we would be opposed to excising these provisions from the bill in their entirety and placing on the pipeline the burden of justifying, in a subsequent Section 5 rate case or a Section 7 certificate proceeding the field price levels which we anticipate.

Following deregulation of producers, price levels will rise substantially, as they must if the domestic exploration for natural gas is to expand dramatically, as the public interest demands it should. And if there is not some workable statutory guideline as to what would be deemed in the public interest, we are concerned that all of the controversies, issues and delays of producer regulation will simply be transferred over to pipeline certificate and rate cases with the same depressing effects on bringing forth new natural gas supplies which producer regulation has had over the years.

Therefore, it is A. G. A.'s position that the interstate pipeline should be entitled to uncontested approval of its purchased gas costs so long as the full purchase price does not exceed a specific economic index based on the prices paid for alternate sources of energy. A. G. A. is investigating such an index and we will apprise the Committee of our recommendations as soon as possible.

Our comments regarding certain other parts of S. 2806 are:

We are opposed to the statutory limitations proposed in Title VII on imports of energy, at least until the nation has attained energy self-sufficiency. To do otherwise could deprive the nation of badly needed supplies during this period of shortages. The President should have the authority to decide which imports of energy are not in the national interest.

We support the objective of relaxing import controls on certain steel drilling and mining equipment.

We support the objectives of Title VIII (Export Limitations) but believe the implementing authority should be vested in the President or the top Administration office or officers on energy policy.

We believe that eventually when natural gas attains its true market value through deregulation and gas supply and demand is brought reasonably into balance, there will be no need for special tax incentives. However, it should be emphasized that the natural gas industry is now making huge capital expenditures and will have to continue to do so for a long time in the future, if it is to obtain adequate supplies. Therefore, it is most important that efforts be made to increase cash flow and to strengthen the financing abilities of the natural gas industry. The provisions of Title IX—Tax Incentives—could help, particularly Section 902 as it relates to R&D operations, but the major assistance would be deregulation and proper weight by regulatory commissions to current financing problems in rate determinations.

We oppose the provisions of Title X which would remove foreign percentage depletion and intangible drilling and development cost deduction. The energy shortage is worldwide and every Btu of energy developed throughout the world will indirectly ease the situation in the United States. Most important, elimination of these deductions could hamper large exploratory programs in foreign countries, particularly Canada, which it is hoped will result in deliveries of energy to the United States.

We support the proposed credit or deduction for residential energy conservation expenditures.

We believe that the transfer of jurisdiction of Naval reserves proposed by Title XI should be decided by Congress after full consideration of national security implications.

We oppose the proposed comprehensive plans for land use or disposition and the proposal for increased production of oil and gas on Federal lands, with the Secretary of Interior having authority to increase rates of production. The production industry which has a history of sound producing practices, should continue to have such control and will cooperate with the Administration on specific changes that might be necessary.

## NEWS RELEASE

AMERICAN PETROLEUM INSTITUTE,  
Washington, D.C., September 4, 1973.

DEREGULATION OF NATURAL GAS PRICES WOULD HAVE SMALL EFFECT ON  
CONSUMERS

WASHINGTON, Sept. 3.—If the government were to stop regulating the field price of natural gas, the impact on the gas bill of the average householder would be minor.

This is revealed today in a study prepared by Foster Associates, Inc., a Washington, D.C., consulting firm, which made the 150-page study at the request of the American Petroleum Institute.

Frank N. Ikard, president of the Institute, commented, "By now, it has become obvious to nearly everyone that we have a serious shortage of natural gas, and that we have this shortage because of 20 years of government price-fixing. It is imperative that Congress take action now to provide adequate incentive to draw the gas producing industry back into the business of exploring for and producing natural gas."

Bills have been introduced for consideration by the current session of Congress which would eliminate price-fixing for natural gas in the field upon expiration of existing contracts, or for any new gas which might be found. Other proposed legislation would remove all field prices from regulation by the Federal Power Commission.

The Foster Associates study concludes that if the field price of all natural gas *not* under contract immediately rose to 55 cents per thousand cubic feet, the average householder would pay only \$8.30 more per year for his supply starting next Jan. 1. This would be an increase of only 5.3 per cent on an average yearly bill of \$155.73. By 1980, the price increase would amount to \$33.06 annually. (The average price of natural gas now sold in interstate commerce is about 21 cents per thousand cubic feet.)

The study shows that price increases to the householder would be gradual and minor for two reasons:

Most of the gas now being sold is under fixed price contracts, generally for periods of 20 years.

Only 17 per cent of the consumer's bill consists of the field price of natural gas. The rest goes to pipe line companies and local distributors.

The study also lists the increases the consumer might expect if the field price went to other assumed levels, either higher or lower than 55 cent per thousand cubic feet.

Under these various assumed levels, the increase in the householder's yearly bill would range from 4.2 per cent to 7.6 per cent. Also included in the study are data on the consumer impact at various assumed field price levels of alternate approaches, such as deregulation of only new gas sales and the deregulation of new gas sale prices coupled with a phase-out of controls over flowing gas.

According to the study, only 12 per cent of the natural gas now under contract is covered by contracts which permit price escalation to whatever may be the ultimate market price. By 1980, 27 per cent of the gas under pre-1973 contracts will be covered by such contracts.

The study cites data compiled by the U.S. Bureau of Labor Statistics showing that as of December, 1972, the cost of natural gas service for the average moderate income family accounted for only 1.20 per cent of total family expenses. By contrast, 2.10 per cent was spent on tobacco, 2.46 on alcoholic beverages and 1.33 per cent on household supplies.

The study points out that the price of natural gas to the residential consumer increased only 19 per cent between 1960 and 1972. By comparison, the overall Consumer Price Index during the same period rose 41 per cent.

At the same time, the study shows, the cost of drilling wells—a financially risky enterprise—rose from \$17.60 per foot in 1961 to \$27.63 in 1971, an increase of 57 per cent.

"This combination of artificially low prices and sharply rising producer costs," API President Ikard noted, "has resulted in a sharp decline in exploratory drilling. As a result, natural gas reserves have dwindled at a time when the number of households which use natural gas has increased by 30 per cent, and consumption per customer has risen 25 per cent."

The study contains no estimates of how much consumer costs would increase if Congress does not end government price-fixing on natural gas, but the study emphasizes that continued price-fixing "would have its own 'costs.'"

It said that if present controlled price levels continue in the field "we may anticipate a continued decline in exploration and drilling for new gas supplies and a further dwindling of new supply additions to replace existing depleting reservoirs."

[Whereupon, the hearing in the above-entitled matter was recessed at 4:10 o'clock p.m., to reconvene at 9:30 o'clock a.m., Friday, January 25, 1974.]

