

Y4
In 8/13
En 2/12
PT. 1

1040

94/14
In 8/13
1-2
1-2
1-2

GOVERNMENT

Storage
Storage

DOCUMENTS

JUN 23 1975

THE LIBRARY
KANSAS STATE UNIVERSITY

HEARINGS

BEFORE THE

COMMITTEE ON
INTERIOR AND INSULAR AFFAIRS
UNITED STATES SENATE

NINETY-FOURTH CONGRESS

FIRST SESSION

ON

S. 740

A BILL TO PROMOTE THE GENERAL WELFARE BY ESTABLISHING A NATIONAL ENERGY PRODUCTION BOARD TO ASSURE EARLY DEVELOPMENT OF ENERGY RESOURCES ON THE PUBLIC DOMAIN AND ON OTHER FEDERAL LANDS AND ON THE OUTER CONTINENTAL SHELF IN ORDER TO OVERCOME THE DEPENDENCE OF THE UNITED STATES ON FOREIGN NATIONS FOR ENERGY SUPPLIES WHICH ARE ESSENTIAL TO NATIONAL SECURITY, COMMERCE, AND A FULL-EMPLOYMENT ECONOMY

MARCH 20, APRIL 14 AND 15, 1975



Printed for the use of the
Committee on Interior and Insular Affairs

U.S. GOVERNMENT PRINTING OFFICE

WASHINGTON : 1975

51-714 O

AUTHENTICATED
U.S. GOVERNMENT
INFORMATION



COMMITTEE ON INTERIOR AND INSULAR AFFAIRS

HENRY M. JACKSON, Washington, *Chairman*

FRANK CHURCH, Idaho

LEE METCALF, Montana

J. BENNETT JOHNSTON, Louisiana

JAMES ABOUREZK, South Dakota

FLOYD K. HASKELL, Colorado

JOHN GLENN, Ohio

RICHARD STONE, Florida

DALE BUMPERS, Arkansas

PAUL J. FANNIN, Arizona

CLIFFORD P. HANSEN, Wyoming

MARK O. HATFIELD, Oregon

JAMES A. McCLURE, Idaho

DEWEY F. BARTLETT, Oklahoma

GRENVILLE GARSIDE, *Special Counsel and Staff Director*

DANIEL A. DREYFUS, *Deputy Staff Director for Legislation*

WILLIAM J. VAN NESS, *Chief Counsel*

D. MICHAEL HARVEY, *Deputy Chief Counsel*

HARRISON LOESCH, *Minority Counsel*

(II)

CONTENTS

Hearings:	Page
March 20, 1975	1
April 14, 1975	141
April 15, 1975	181
S. 740	3

THURSDAY, MARCH 20, 1975

STATEMENTS

Fowler, Hon. Henry H., former Secretary of the Treasury	48, 54
Jackson, Hon. Henry M., a U.S. Senator from the State of Washington	1
Nathan, Robert, of Robert Nathan Associates, Inc.	112, 116
Rohatyn, Felix G., partner, Lazard Freres & Co., New York, N.Y.	130
Woodcock, Leonard, president of United Automobile, Aerospace & Agricultural Implement Workers of America, UAW	95, 97

MONDAY, APRIL 14, 1975

STATEMENTS

Blumenthal, W. Michael, president, the Bendix Corp., Bendix Center, Southfield, Mich.	156, 160
Jackson, Hon. Henry M., a U.S. Senator from the State of Washington	141
McCormack, Hon. Mike, a U.S. Representative from the State of Washington	142

TUESDAY, APRIL 15, 1975

STATEMENTS

Bunting, John R., chairman, First Pennsylvania Bank N.A. & First Pennsylvania Corp.	182, 185
Jackson, Hon. Henry M., a U.S. Senator from the State of Washington	181
Luce, Charles F., chairman of the board, Consolidated Edison Co. of New York, Inc.	186
Sawhill, Dr. John C., consultant, A. B. T. Associates, Inc.	201
Stevenson, Hon. Adlai, a U.S. Senator from the State of Illinois	210

ADDITIONAL MATERIAL

"A Battle Plan To Beat the Energy Crisis," by Charles F. Luce, reprinted from the March 1975 issue of Reader's Digest	193
Geologic Committee Details U.S. Gas/Oil Assessment Plan—\$2 Billion Program Would Include 530,000 Miles of Oceanographic Traverses Using Latest Seismic Technology, 100 Offshore Test Wells, from the World Oil	199

APPENDIX

ADDITIONAL MATERIAL SUBMITTED BY SECRETARY FOWLER

"Financing Free World Energy Supply and Use," by John E. Gray, reprinted from The Atlantic Community Quarterly	254
"Mobilizing the Utilities for War," by Edward Falck, reprinted from the July 6, 1944, issue of Public Utilities Fortnightly	298
"World Energy and U.S. Leadership," by Harlan Cleveland, reprinted from The Atlantic Community Quarterly	231

NATIONAL ENERGY PRODUCTION BOARD

THURSDAY, MARCH 20, 1975

U.S. SENATE,
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS,
Washington, D.C.

The committee met, pursuant to notice, at 10 a.m. in room 3110, Dirksen Office Building, Hon. Henry M. Jackson, chairman, presiding.
Present: Senators Jackson, Johnston, Glenn, and Stone.

Also present: Grenville Garside, special counsel and staff director; Thomas Platt, professional staff member for the majority; and David Stang, deputy director for the minority.

The CHAIRMAN. The committee will come to order.

OPENING STATEMENT OF HON. HENRY M. JACKSON, A U.S. SENATOR FROM THE STATE OF WASHINGTON

The CHAIRMAN. This morning the Senate Committee on Interior and Insular Affairs begins hearings on S. 740, a bill I introduced in February proposing establishment within the executive branch of the Government of a National Energy Production Board. To supplement efforts already underway in the private sector, this bill envisages the rapid mobilization of the materials, manpower, and financial resources needed to accelerate, on an urgent basis, the exploration, development, and production of the vast coal, oil, and gas reserves that underlie our public lands, including our Alaska reserves and the Outer Continental Shelf. The bill anticipates that all of the available resources of the Federal Government, including the expertise and facilities of the pertinent Federal departments and agencies, will be brought to bear in support of this enormously important national effort.

I have said before, and it bears repeating, that a massive national energy production program is imperative if the Nation is to achieve the degree of energy self-sufficiency it needs to insure the independence of our foreign policy and the stability of our economy. Certainly, the key to this program is Government action to develop federally-owned energy resources beneath the public lands and the Outer Continental Shelf, resources the Government holds in trust to be used for the benefit of all Americans.

The proposed National Energy Production Board would spearhead this national effort. It would inventory the status of all Government and other programs to increase coal, oil, and gas production both on the public domain and elsewhere, and the availability of the materials, manpower and other resources to maximize domestic production generally. Its mission would include formulating plans and programs

for the rapid exploration of the Outer Continental Shelf and the development of the Naval Petroleum Reserves for the use of idle, underutilized and surplus Federal installations and facilities for the manufacture and production of equipment and materials that are in short supply and essential for the accelerated development and production program; and for coal production and oil and gas production from the Federal lands generally, including the Outer Continental Shelf.

The Board would also develop a major Federal program to improve and augment the Nation's railroads and other energy transportation systems to provide the reliable and safe transport capacity needed to move energy resources from the mine or wellhead to markets throughout the Nation. And, what is highly important, the Board would be commissioned to identify Federal agency procedures that create bottlenecks and unreasonably delay high priority agency development projects in the private sector, and to recommend steps to remove such bottlenecks.

As the bill is now structured, the Board would be authorized to move ahead immediately with an Outer Continental Shelf exploration program. Otherwise, its plans and programs would have to be transmitted to the Congress for review and, where necessary, additional authorizing legislation.

Let me emphasize at the outset of this hearing that S. 740 was introduced to provide a basis for discussion of the National Energy Production Board concept. The scope of the Board's authority and mandate must be refined and detailed as the committee considers the legislation. No nation on earth responds to a critical challenge as well as the United States. When the chips are down, we have on many occasions demonstrated the capacity to establish priorities and organize for action. Our wartime mobilization under the leadership of the War Production Board in World War II is one example. The Apollo program in the 1960's is another. The challenge we now face to overcome our dependence on foreign energy sources, merits a comparable national response.

At this time, I will insert into the record a copy of the proposed legislation we are considering today.

[The text of S. 740 follows:]

94TH CONGRESS
1ST SESSION

S. 740

IN THE SENATE OF THE UNITED STATES

FEBRUARY 18, 1975

Mr. JACKSON (for himself, Mr. MAGNUSON, Mr. BAYH, Mr. LEAHY, and Mr. STEVENSON) introduced the following bill; which was read twice and referred to the Committee on Interior and Insular Affairs

A BILL

To promote the general welfare by establishing a National Energy Production Board to assure early development of energy resources on the public domain and on other Federal lands and on the Outer Continental Shelf in order to overcome the dependence of the United States on foreign nations for energy supplies which are essential to national security, commerce, and a full-employment economy.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*
3 That this Act may be cited as the "National Energy Produc-
4 tion Board Act of 1975".

5 SEC. 2. FINDINGS.—The Congress finds and declares
6 that:

II

1 (a) It is the policy and the goal of the United States to
2 overcome as rapidly as possible the dependence of the United
3 States on foreign sources of energy.

4 (b) The achievement of this goal is essential to insure
5 the independence of our foreign policy, to improve our
6 balance-of-payments equilibrium, and to maintain national
7 security.

8 (c) With proper planning this goal can be achieved
9 without damaging the quality of the environment or impair-
10 ing the quality of life of the American people.

11 (d) The public domain, other Federal lands, and the
12 Outer Continental Shelf contain enormous energy resources
13 of coal, oil, natural gas, oil shale, geothermal, and uranium
14 which have not been adequately explored or developed.

15 (e) Programs to explore for and develop Federal en-
16 ergy resources and to provide the essential systems to trans-
17 port energy from producing areas to consuming markets
18 can stimulate the economy, help overcome unemployment,
19 and provide meaningful new employment opportunities in
20 public and private sectors.

21 (f) To the extent that existing energy resource and
22 development programs and the efforts of the private sector
23 to develop federally owned energy resources fall short of
24 achieving desired levels of domestic self-sufficiency the Fed-
25 eral Government should undertake innovative direct and

1 indirect actions to increase available domestic energy
2 supplies.

3 (g) To best achieve the objective of greater domestic
4 self-sufficiency and to assure a maximum national effort to
5 bring the Nation's domestic energy resources into balance
6 with demand, it is necessary to accelerate conservation
7 efforts and to establish a Federal authority empowered to
8 define and propose to the Congress specific action programs
9 to utilize all of the resources of the private and public sectors
10 to increase domestic energy supply, to monitor domestic
11 energy production, and to identify significant constraints
12 on increasing domestic energy production.

13 SEC. 3. PURPOSE.—It is the purpose of this Act—

14 (a) to assure that the resources of private enter-
15 prise and the Federal Government, including the tech-
16 nical and managerial expertise of all relevant Federal
17 agencies are effectively committed to maximizing domes-
18 tic energy exploration, development, and production;

19 (b) to stimulate the economy and to create needed
20 employment through a vigorous program of direct and
21 indirect Federal involvement to supplement private
22 sector efforts in increasing domestic energy supply and in
23 improving energy transportation systems; and

24 (c) to enhance competition in the energy industry
25 by assisting small independent companies to engage in

1 exploration and production for oil and gas in conjunc-
2 tion with the Federal Government on the Outer Con-
3 tinental Shelf and on the public domain and Federal
4 lands in Alaska.

5 SEC. 4. DEFINITIONS.—As used in this Act, the term—

6 (a) “Board” means the National Energy Produc-
7 tion Board;

8 (b) “Chairman” means the Chairman of the Board;

9 (c) “public domain and other Federal lands” means
10 all lands, including mineral interests, owned by the
11 United States without regard to how the United States
12 acquired ownership thereof and without regard to the
13 agency having responsibility for management thereof,
14 except—

15 (1) Indian lands;

16 (2) Outer Continental Shelf lands; and

17 (3) Components of the National Park, Wilder-
18 ness Preservation, Wild and Scenic Rivers, and
19 Trails Systems; rivers being studied as potential
20 additions to the National Wild and Scenic Rivers
21 System under or pursuant to section 5(a) of the
22 Wild and Scenic Rivers Act (82 U.S.C. 906), road-
23 less or other de facto wilderness areas being studied
24 to determine their suitability or nonsuitability for
25 preservation as wilderness under or pursuant to the

1 Wilderness Act (78 Stat. 890) or the Act of Jan-
2 uary 3, 1975 (88 Stat. 2096), and rivers or areas
3 proposed by the President for inclusion in the Na-
4 tional Wild and Scenic Rivers System or National
5 Wilderness Preservation System; and National Rec-
6 reation Areas designated by Acts of Congress;

7 (4) Naval Petroleum Reserves;

8 (d) "Fund" means the National Energy Production
9 Trust Fund;

10 (e) "Indian lands" means all lands, including min-
11 eral interests, within the exterior boundaries of any In-
12 dian reservation notwithstanding the issuance of any
13 patent, and including rights-of-way, and all lands held
14 in trust for or supervised by an Indian tribe;

15 (f) "Indian tribe" means any Indian tribe, band,
16 group, or community having a governing body recog-
17 nized by the Secretary of the Interior;

18 (g) "Member" means a member of the Board other
19 than the Chairman;

20 (h) "Outer Continental Shelf lands" means the
21 Outer Continental Shelf as defined in the Outer Conti-
22 nental Shelf Lands Act (67 Stat. 462); and

23 (i) "Naval Petroleum Reserves" means the Naval
24 Petroleum Reserve Numbered 1 (Elk Hills), located in
25 Kern County, California, established by Executive Order

1 of the President of September 2, 1912; Naval Petroleum
2 Reserve Numbered 2 (Buena Vista Hills), located in
3 Kern County, California, established by Executive order
4 of the President of December 31, 1915; Naval Petro-
5 leum Reserve Numbered 3 (Teapot Dome), located in
6 Wyoming, established by Executive order of the Presi-
7 dent of December 13, 1912; and Naval Petroleum Re-
8 serve Numbered 4, Alaska, on the north slope of the
9 Brooks Range, established by Executive order of the
10 President of February 27, 1923.

11 (j) "State" means any State of the United States,
12 the District of Columbia, the Commonwealth of Puerto
13 Rico, the Virgin Islands, Guam, American Samoa, the
14 Canal Zone, and the Trust Territory of the Pacific
15 Islands.

16 TITLE I—NATIONAL ENERGY PRODUCTION

17 BOARD

18 SEC. 101. ESTABLISHMENT.—(a) There is hereby es-
19 tablished a special executive agency to be known as the
20 National Energy Production Board (hereinafter in this Act
21 referred to as the "Board").

22 (b) The Board shall consist of a Chairman and four
23 members appointed by the President, by and with the advice
24 and consent of the Senate. The Chairman and the members
25 of the Board shall be persons who, as a result of their train-

1 ing, experience, and attainments in academia, industry, com-
2 merce, and/or government, are exceptionally well qualified
3 to formulate, recommend, carry out, and monitor plans and
4 programs to accelerate and increase the exploration for and
5 the development and production of the domestic energy re-
6 sources of the Federal lands and the Outer Continental Shelf,
7 on an urgent basis, and in keeping with the Nation's environ-
8 mental goals and in full recognition of the important respon-
9 sibilities of affected State governments. Appointments of the
10 Chairman and members pursuant to this subsection shall be
11 made in such a manner that not more than three members of
12 the Board including the Chairman shall be members of the
13 same political party. The Chairman and each member shall
14 serve for a term of five years, except that of the Chairman
15 and members first appointed to the Board; one shall serve
16 for one year, one for two years, one for three years, one for
17 four years, and one for five years, to be designated by the
18 President at the time of appointment.

19 (c) The Chairman of the Board shall receive compensa-
20 tion at the rate prescribed for offices and positions at level I
21 of the Executive Schedule (5 U.S.C. 5312). The members
22 of the Board shall receive compensation at the rate prescribed
23 for offices and positions at level II of the Executive Schedule
24 (5 U.S.C. 5313). The Board shall be administered under

1 the supervision and direction of the Chairman. Neither the
2 Chairman nor any member of the Board shall—

3 (1) engage in any other employment or hold any
4 other position in the executive branch during the period
5 of his appointment;

6 (2) have any financial interest or relationship, di-
7 rect or indirect, with any person engaged in the explora-
8 tion, production, processing, transportation, distribution,
9 or marketing of coal, uranium, natural gas, crude oil,
10 or petroleum products;

11 (3) after his service on the Board has ended, repre-
12 sent anyone other than the United States in connection
13 with a matter in which the Board is a party or has an
14 interest and in which he participated personally and sub-
15 stantially for the Board; or

16 (4) receive any emoluments, salary, or supple-
17 mentation of his Government salary, from a private
18 source as compensation for his services to the Board.

19 SEC. 102. VACANCIES.—Vacancies in the membership
20 of the Board shall not affect the power of the remaining
21 members to execute the functions of the Board and shall be
22 filled in the same manner as in the case of original appoint-
23 ment.

24 SEC. 103. VICE CHAIRMAN.—The Board shall select
25 a Vice Chairman from among its members. The Vice Chair-

1 man shall act in the place and stead of the Chairman in the
2 absence of the Chairman.

3 SEC. 104. GENERAL COUNSEL.—There shall be a Gen-
4 eral Counsel to the Board who shall be appointed by the
5 President, by and with the advice and consent of the Senate,
6 and who shall receive compensation at the rate prescribed
7 for offices and positions at level III of the Executive Schedule
8 (5 U.S.C. 5314).

9 SEC. 105. MEETINGS AND ORGANIZATION.—(a) The
10 Board is authorized to sit and act at such places and times
11 as it may determine, and upon a vote of a majority of its
12 members, to require by subpoena or otherwise the attendance
13 of such witnesses and the production of such books, papers,
14 and documents, to administer such oaths and affirmations, to
15 take such testimony, to procure such printing and binding,
16 and to make such expenditures, as it deems advisable. The
17 Board may make such rules respecting its organization and
18 procedures as it deems necessary, except that no recommen-
19 dation shall be reported from the Board without an opportu-
20 nity for dissenting members to present their views. Subpenas
21 may be issued over the signature of the Chairman of the
22 Board, or of any voting member designated by him or by the
23 Board, and may be served by such person or persons as may
24 be designated by such Chairman or member. The Chairman

1 of the Board or any member thereof may administer oaths or
2 affirmations to witnesses.

3 (b) The Chairman may appoint, with the approval
4 of the Board, an executive director who shall exercise such
5 powers and duties as may be delegated to him by the
6 Board. The executive director shall receive basic pay at
7 the rate provided for level III of the Executive Schedule
8 (5 U.S.C. 5314).

9 SEC. 106. POWER AND AUTHORITY.—(a) The Board
10 shall have the authority, subject to the provisions of this
11 Act and, within the limits of available appropriations, to
12 do all things necessary to carry out the purposes of this Act,
13 including the authority to—

14 (1) make full use of competent personnel and
15 organizations outside the Board, public or private, and
16 form advisory committees, special ad hoc interagency
17 task forces, and make other personnel arrangements in
18 accord with Federal law, as the Board determines to be
19 appropriate;

20 (2) enter into contracts or other arrangements as
21 may be necessary for the conduct of the work of the
22 Board with any agency or instrumentality of the United
23 States, with any State, territory, or possession or any
24 political subdivision thereof, or with any person, firm,
25 association, corporation, or educational institution, with

1 or without reimbursement, with or without performance
2 or other bonds, and with or without regard to section 5
3 of title 41, United States Code;

4 (3) make advance, progress, and other payments
5 which relate to the functions of the Board without regard
6 to the provisions of section 529 of title 31, United States
7 Code;

8 (4) accept and utilize the services of voluntary
9 and uncompensated personnel necessary for the con-
10 duct of the work of the Board and provide transporta-
11 tion and subsistence as authorized by section 5703 of
12 title 5, United States Code, for persons serving without
13 compensation;

14 (5) acquire by purchase, lease, loan, or gift, and
15 hold and dispose of by sale, lease, or loan, real and per-
16 sonal property of all kinds necessary for or resulting
17 from the exercise of authority granted by this Act; and

18 (6) prescribe such rules and regulations as it deems
19 necessary governing the operation and organization of
20 the Board.

21 (b) Contractors and other parties entering into con-
22 tracts and other arrangements under this section which in-
23 volve costs to the Government shall maintain such books and
24 related records as will facilitate an effective audit of the
25 execution of such contracts or arrangements in such detail

1 and in such manner as shall be prescribed by the Board,
2 and such books and records (and related documents and
3 papers) shall be available to the Board and the Comp-
4 troller General of the United States, or any of their duly
5 authorized representatives, for the purpose of such audit
6 and examination.

7 (c) The Board is authorized to secure directly from any
8 executive department or agency information, suggestions,
9 estimates, statistics, and technical assistance for the purpose
10 of carrying out its functions under this Act. Each such execu-
11 tive department or agency shall furnish the information, sug-
12 gestions, estimates, statistics, and technical assistance directly
13 to the Board upon its request.

14 (d) On request of the Board, the head of any execu-
15 tive department or agency may detail, with or without reim-
16 bursement, any of its personnel to assist the Board in carry-
17 ing out its functions under this section.

18 (e) The Chairman shall, in accordance with such poli-
19 cies as the Board shall prescribe, appoint and fix the com-
20 pensation of such personnel as may be necessary to carry
21 out the provisions of this Act, and obtain services of experts
22 and consultants in accordance with section 3109 of title 5,
23 United States Code.

24 TITLE II—DUTIES AND RESPONSIBILITIES

25 SEC. 201. GENERAL DUTIES.—(a) In addition to

1 the specific duties assigned to the Board in section 202 of
2 this title and in titles III and IV of this Act the Board
3 is authorized and directed to review, monitor, and period-
4 ically report to the Congress on—

5 (1) the current status of all activities and programs
6 being conducted by the Board and all other agencies
7 and departments of the Federal Government to increase
8 the production of coal, oil, natural gas, and other energy
9 resources from the public domain; and other Federal
10 lands, and the Outer Continental Shelf;

11 (2) the current status of all significant activities
12 and programs being conducted by private enterprise and
13 non-Federal agencies to increase the production of coal,
14 oil, natural gas, and other energy resources from sources
15 within the United States;

16 (3) the current status of all significant activities
17 and programs being conducted outside the United States
18 to increase the production of coal, oil, and natural gas
19 which may influence (A) the availability of energy
20 supplies for the United States or (B) the availability
21 of personnel, material, and equipment, including but
22 not limited to drilling platforms and rigs, for the
23 exploration, development, and production of domestic
24 energy resources;

25 (4) the availability of essential materials, equip-

1 ment, supplies, and trained manpower in the private
2 sector to achieve maximum production from domestic
3 energy resources in a manner that is compatible with
4 environmental standards and other resource demands;
5 and

6 (5) any significant delays in domestic energy ex-
7 ploration and production programs which are exclusively
8 the result of regulatory delay or procedural impedi-
9 ments at the Federal, State, or local level.

10 (b) The reports to the Congress required by this sec-
11 tion shall be transmitted quarterly.

12 SEC. 202. OIL AND GAS EXPLORATION PROGRAM.—

13 (a) The Board is authorized and directed to prepare and
14 carry out a Federal oil and gas exploration program. The
15 exploration program shall supplement the activities of the
16 private sector and shall provide for an immediate com-
17 mencement of the and comprehensive exploration of the
18 public domain and Federal lands of the United States and
19 the Outer Continental Shelf to obtain sufficient data and
20 information to evaluate the extent, location, and potential
21 value for development of the oil and gas resources of said
22 lands. The program shall be designed to obtained the
23 resource information necessary for determining the quanti-
24 ties of oil and gas present, the geographical extent of any
25 field, and estimates of the recoverable reserves in order to—

1 (1) prepare the Federal oil and gas production plan
2 called for by section 404 of this Act;

3 (2) improve the information regarding the value of
4 public resources and revenues which should be antici-
5 pated from development;

6 (3) increase competition among producers of oil and
7 gas by providing data and information to all potential
8 developers; and

9 (4) provide the public with information respecting
10 the size of the public resources, the cost of developing
11 specific resources for commercial use, and the value of
12 such resources.

13 (b) In carrying out the exploration program the Board
14 is authorized and directed to—

15 (1) conduct or contract for seismic, geomagnetic,
16 gravitational, geophysical, or geochemical surveys, or
17 stratigraphic drilling, or to purchase or contract for the
18 results of such exploratory activities from commercial
19 sources;

20 (2) conduct or contract for such exploratory drilling
21 as is necessary to indicate the probable extent of the
22 resources and obtain sufficient information concerning
23 geological factors that may affect the development of the
24 resources;

25 (3) prepare and publish a projected schedule of

1 exploratory activities and identification of the areas to
2 be explored;

3 (4) consult with affected State and local govern-
4 ments including coordination with coastal management
5 programs being developed by any coastal State for
6 approval pursuant to section 305 of the Coastal Zone
7 Management Act of 1972 (86 Stat. 1280; 16 U.S.C.
8 1451 et seq.) and the coastal zone management pro-
9 gram of any State which has been approved pursuant to
10 section 306 of that Act, with particular reference to
11 the anticipated location of required rights-of-way, trans-
12 portation, and other on-shore facilities required to im-
13 plement the program;

14 (5) prepare and publish estimates of the funds,
15 materials, and manpower required to carry out the
16 exploration program;

17 (6) prepare and publish assessments of the avail-
18 ability of the facilities, material, equipment, and man-
19 power required to carry out the exploration program;

20 (7) procure the necessary facilities, materials, and
21 equipment; and

22 (8) consult with the Administrator of the Environ-
23 mental Protection Agency before proceeding with any
24 exploration so that he can identify exceptional, unique,
25 or unusual conditions that may require special treatment

1 or precautions to protect the environment or insure safe
2 exploration activities.

3 TITLE III—PROGRAMS FOR CONGRESSIONAL
4 REVIEW WITH RIGHT OF DISAPPROVAL

5 SEC. 301. NAVAL PETROLEUM RESERVES DEVELOP-
6 MENT AND PRODUCTION PROGRAM.—(a) Subject to the
7 provisions of this Act the Board is authorized and directed
8 to prepare and carry out a Naval Petroleum Reserves De-
9 velopment and Production Program for Naval Petroleum
10 Reserves Numbered 1, 2, and 3 located in California and
11 Wyoming. The Naval Petroleum Reserves Development and
12 Production Program shall provide for the immediate de-
13 velopment of said reserves to a state of ready availability
14 and production for use to meet emergency needs of national
15 security for strategic oil storage, and critical civilian require-
16 ments. In carrying out the program the Board shall prepare
17 and publish a report specifying—

18 (1) a plan for implementing the Naval Petroleum
19 Reserves Development and Production Program, in-
20 cluding designation of the department, agency, or in-
21 strumentality of the Federal Government that will have
22 lead agency responsibility for execution of the program,
23 and provision for monitoring of the program by the
24 Board;

25 (2) the development and production facilities,

1 transportation facilities, storage facilities, materials and
2 equipment, including but not limited to drilling rigs,
3 piping, and other steel products, plant and equipment,
4 and the manpower required for the program;

5 (3) arrangements for procurement of necessary
6 development, production, transportation, and storage
7 facilities, plant, materials and equipment, including to
8 the extent required Federal or federally assisted pro-
9 curement of same;

10 (4) estimates of cost;

11 (5) arrangements for financing the program;

12 (6) anticipated location of required development,
13 production, right-of-way, transportation, storage, and
14 other facilities required to implement the program;

15 (7) the anticipated impact on the economic, social,
16 institutional structure of adjacent areas and communi-
17 ties affected by the program;

18 (8) the organization for management and control of
19 the program;

20 (9) procedures for consultation with affected State
21 and local governments; and

22 (10) any legal questions, complications or con-
23 flicts potentially engendered by the plan.

24 (b) The Board is directed to transmit the Naval Petro-
25 leum Reserves Development and Production program to the

1 Congress not later than ninety days after the effective date of
2 this section.

3 (c) Subject to the availability of funds under the author-
4 ization of appropriations contained in section 602 of this Act,
5 the Board may proceed with the implementation of the pro-
6 gram at the end of the first period of sixty calendar days
7 after the program has been submitted to both Houses of the
8 Congress. Each House shall have the opportunity to
9 disapprove of such program within sixty days of the receipt
10 of the proposal, pursuant to the procedures provided for in
11 sections 906 (a), (b), and (c), 908, 909, 910, 911, 912,
12 and 913 of title 5, United States Code, except that for the
13 purposes of this section any reference in such sections to "re-
14 organization plan" shall be deemed to be a reference to Naval
15 Petroleum Reserves Development and Production program.
16 If the program is disapproved by either House within the
17 sixty-day review period, no officer or agency shall have au-
18 thority to take the action proposed in the program.

19 SEC. 302. ALASKA NAVAL PETROLEUM RESERVE EX-
20 PLORATION PROGRAM.—(a) Subject to the provisions of this
21 Act the Board is authorized and directed to prepare and
22 carry out a Naval Petroleum Reserve Numbered 4 Explora-
23 tion Program. The exploration program shall cover the
24 Naval Petroleum Reserve Numbered 4, in Alaska, estab-
25 lished by Executive order of the President of February 27,

1 1923, and shall provide for an immediate commencement of
2 the comprehensive exploration thereof to obtain sufficient
3 data and information to evaluate the extent, location, and
4 potential for development of the oil and gas resources of the
5 reserve. The program shall be designed to obtain the resource
6 information necessary for determining the quantities of oil
7 and gas present, the geographical extent of any field, and
8 estimates of its recoverable reserves in order to provide a
9 basis for—

10 (1) developing an oil and gas development plan;
11 (2) improving the information regarding the value
12 of public resources and revenues which should be antici-
13 pated from development;

14 (3) increasing competition among producers of oil
15 and gas by providing data and information to all poten-
16 tial developers; and

17 (4) providing the public with information respect-
18 ing the extent and anticipated value of public resources.

19 (b) The Board shall prepare and publish a Naval
20 Petroleum Reserve Numbered 4 Exploration Program report
21 which shall include:

22 (1) a plan to implement the Naval Petroleum Re-
23 serve Numbered 4 Exploration Program, including the
24 designation of the Federal department, agency, or instru-
25 mentality that will direct and supervise execution of the

1 program, and provision for monitoring of the program
2 by the Board;

3 (2) a plan for the conduct of geophysical surveys,
4 geochemical surveys, or stratigraphic drilling, or to
5 purchase the results of such exploratory activities from
6 commercial sources;

7 (3) a plan to conduct or contract for such explora-
8 tory drilling as necessary to prove the extent of the re-
9 sources and to obtain sufficient information concerning
10 the geology which may affect the development of the
11 resources;

12 (4) a projected schedule of exploratory activities
13 and identification of the areas to be explored;

14 (5) procedures for consultation with affected State
15 and local governments;

16 (6) estimates of the financial, material, and man-
17 power required to carry out the exploration program;

18 (7) assessment of the availability of the facilities,
19 material, equipment, and manpower required to carry
20 out the exploration program;

21 (8) arrangements for procurement of the necessary
22 facilities, materials, and equipment, including to the ex-
23 tent required Federal or federally assisted procurement
24 of same;

25 (9) anticipated location of required exploration

1 right-of-way, transportation, and other facilities required
2 to implement the program;

3 (10) the organization for management and control
4 of the program.

5 (c) The Board is directed to transmit the Naval Petro-
6 leum Reserve Number 4 exploration program to the Con-
7 gress not later than ninety days after the effective date of
8 this section.

9 (d) Subject to the availability of funds under the au-
10 thorization of appropriations contained in section 602 of this
11 Act, the Board may proceed with the implementation of the
12 program at the end of the first period of sixty calendar days
13 after the program has been submitted to both Houses of
14 the Congress. Each House shall have the opportunity to
15 disapprove of such program within sixty days of the receipt
16 of the proposal, pursuant to the procedures provided for in
17 sections 906 (a), (b), and (c), 908, 909, 910, 911, 912,
18 and 913 of title 5, United States Code, except that for the
19 purposes of this section any reference in such sections to
20 "reorganization plan" shall be deemed to be a reference to
21 Naval Petroleum Reserve Number 4 Exploration Program.
22 If the program is disapproved by either House within the
23 sixty-day review period, no officer or agency shall have
24 authority to take the action proposed in the program.

25 SEC. 303. FEDERAL FACILITIES ENERGY PROGRAM.—

1 (a) Subject to the provisions of this Act, the Board is
2 authorized and directed to prepare and carry out a Federal
3 Facilities Energy Program. The Federal Facilities Energy
4 Program shall provide for the utilization of existing idle,
5 underutilized, or surplus facilities, installations, properties,
6 and resources of the Federal Government to augment the
7 Nation's manufacturing and industrial capacity for the pro-
8 duction and fabrication of materials, equipment, and goods
9 essential for the conduct of an accelerated domestic energy
10 exploration, development, and production program. The
11 Board shall prepare and publish a report for the implemen-
12 tation of the Federal Facilities Energy Program which shall
13 include a timetable for its implementation and:

14 (1) an inventory of federally owned and federally
15 controlled industrial and manufacturing plants and instal-
16 lations, including but not limited to naval shipyards,
17 ship repair facilities, depots, arsenals, and other facilities
18 and installations of the Department of Defense and in-
19 dustrial and manufacturing facilities of other depart-
20 ments, agencies, and instrumentalities of the Federal
21 Government;

22 (2) an inventory and assessment of the capacity
23 of various departments, agencies, and instrumentalities
24 of the Federal Government, including but not limited to
25 the Corps of Engineers of the Department of the Army,

1 the Naval Material Command, Naval Engineering Com-
2 mand, and Naval Ordnance Command of the Depart-
3 ment of the Navy, the Bureau of Reclamation of the
4 Department of the Interior, and the General Services
5 Administration to participate in the management of
6 Federal energy exploration, development, and produc-
7 tion programs;

8 (3) the identification and designation of idle, under-
9 utilized, or surplus Federal facilities and installations
10 capable of, or capable of being adapted to, at reasonable
11 cost, the production of materials and equipment essen-
12 tial for the production of energy and fuels, including
13 but not limited to drilling platforms, drilling rigs, pipe
14 for drilling operations and pipelines, and mining and
15 transportation equipment, goods, and supplies;

16 (4) estimates of the cost of equipping, reequipping,
17 tooling, or retooling such facilities and installations for the
18 production of energy-related materials, goods, and equip-
19 ment;

20 (5) estimates of the availability of the manpower
21 required to staff such Federal installations and facilities;

22 (6) a plan for the conversion of designated appro-
23 priate Federal facilities and installations for production
24 of energy-related materials and equipment;

25 (7) a schedule for the conversion of designated

1 Federal facilities and installations for the production of
2 energy-related materials and equipment;

3 (8) arrangements for management and operation of
4 converted facilities and installations, including designa-
5 tion of the Federal department, agency, or instrumen-
6 tality to manage and supervise same;

7 (9) arrangements for leasing or contracting out
8 Federal facilities and installations for the production of
9 energy-related materials, equipment, and goods;

10 (10) arrangements for procurement of necessary
11 material, equipment, and supplies, including Federal or
12 federally assisted procurement of same;

13 (11) arrangements for consultation with private
14 industry and affected State and local government;

15 (12) anticipated impact on private industry, and
16 on the economic, social, institutional structure of affected
17 areas and communities; and

18 (13) arrangements for reversion or return of facil-
19 ities and installations to the Federal Government as
20 appropriate.

21 (b) The Board is directed to transmit the Federal
22 facilities energy program to the Congress not later than
23 ninety days after the effective date of this section.

24 (c) Subject to the availability of funds under the au-
25 thorization of appropriations contained in section 602 of this

1 Act, the Board may proceed with the implementation of the
2 program at the end of the first period of sixty calendar days
3 after the program has been submitted to both Houses of the
4 Congress. Each House shall have the opportunity to
5 disapprove of such program within sixty days of the receipt
6 of the proposal, pursuant to the procedures provided for in
7 sections 906 (a), (b), and (c), 908, 909, 910, 911, 912,
8 and 913 of title 5, United States Code, except that for the
9 purposes of this section any reference in such sections to
10 "reorganization plan" shall be deemed to be a reference
11 to the Federal Facilities Energy Program. If the program is
12 disapproved by either House within the sixty-day review
13 period, no officer or agency shall have authority to take the
14 action proposed in the program.

15 SEC. 304. EXPEDITING GOVERNMENT ACTION.—(a)
16 The Board is authorized and directed to review and evaluate
17 the procedures and methods of departments, agencies, inde-
18 pendent agencies, regulatory commissions, and other instru-
19 mentalities of the Federal Government with respect to
20 requests for Federal approval, certification, permits, or other
21 forms of Federal authorization for specific projects in the
22 public and private sectors for increasing the exploration, de-
23 velopment, production, and transportation of domestic coal,
24 oil, and natural gas. The review and evaluation required by
25 this subsection shall be designed to identify unreasonable

1 procedural delays and impediments resulting from Federal
2 procedures and requirements that significantly delay decision-
3 making and action on specific projects which are determined
4 to be needed for increasing domestic energy exploration,
5 development, and production.

6 (b) Based on the review and evaluation required by
7 subsection (a), the Board is authorized and directed to pro-
8 pose procedures to other instrumentalities of the Federal
9 Government which are designed to expedite Federal action
10 and overcome procedural delays and institutional impedi-
11 ments: *Provided*, That except as specifically provided for in
12 subsection (c), no provision of this subsection authorizes the
13 Board to propose for implementation any procedure which
14 is not permissible under existing law.

15 (c) (1) Whenever the Board determines that prompt
16 Government action respecting a specific activity or project
17 designed to increase the exploration, development, produc-
18 tion, or transport of domestic energy resources is of high
19 national priority, and is being unreasonably delayed because
20 of procedural problems or impediments in connection with
21 a Federal approval, certification, permit, or licensing process,
22 the Board may recommend an expedited procedure for con-
23 gressional review and approval in accordance with para-
24 graph (3): *Provided*, That the Board may not utilize this
25 subsection to change, amend, modify, or gain an exemption

1 from any substantive standard related to public health, safety,
2 or the quality of the environment: *Provided further*, That
3 use of this expedited procedure in connection with a specific
4 activity or project does not in any way change, amend, or
5 modify for future activities or projects any Federal approval,
6 certification, permit, or licensing process.

7 (2) Any Board recommendation for expedited pro-
8 cedure shall be in the form of an Expedited Energy Project
9 Procedure Report which shall—

10 (A) be limited to a specific activity or project such
11 as a pipeline, an energy facility, or other needed and
12 essential energy project;

13 (B) justify the need for the use of expedited
14 procedures;

15 (C) set forth timetables for action in specific cases
16 and programs;

17 (D) identify exceptions to any departmental and
18 agency review requirements and procedures;

19 (E) identify exceptions to any regulatory require-
20 ments and procedures; and

21 (F) specify proposed changes to expedite the ac-
22 tivity or project;

23 (3) The Expedited Energy Project Procedure Report
24 shall be transmitted to the Congress. The Expedited Energy
25 Project Procedure Report shall become law at the end of

1 the first period of sixty calendar days after said report has
2 been submitted to both Houses of the Congress. Each House
3 shall have the opportunity to disapprove such Expedited
4 Energy Project Procedure Report within sixty days of the
5 receipt of said report, pursuant to the procedures provided
6 in sections 906 (a), (b), and (c), 908, 909, 910, 911,
7 912, and 913 of title 5, United States Code, except that for
8 purposes of this section any reference in such sections to
9 "reorganization plan" shall be deemed to be a reference to
10 an "Expedited Energy Project Procedure Report". If a pro-
11 posed Expedited Energy Project Procedure Report is dis-
12 approved by either House within the sixty-day review period,
13 no officer or agency shall have authority to take the action
14 proposed therein.

15 TITLE IV—PROGRAMS REQUIRING EXPRESS

16 LEGISLATIVE AUTHORIZATION

17 SEC. 401. GENERAL.—The Board is authorized and di-
18 rected to formulate, develop and recommend to the Con-
19 gress in the form of proposed legislation specific action
20 programs as set forth in this title to increase the production
21 of domestic energy resources and strengthen energy trans-
22 portation systems. Each proposed legislative action program
23 transmitted to the Congress pursuant to this title shall be
24 accompanied by a report which meets the requirements
25 of this Act and which provides background and analytical

1 information relevant to a reasoned decision on the proposed
2 legislative program by the Congress.

3 SEC. 402. COAL PRODUCTION.—The Board shall pre-
4 pare a Federal Coal Production Program. The Federal Coal
5 Production Program shall consist of a legislative recommen-
6 dation for the accelerated exploration, development and pro-
7 duction of coal under existing Federal leases and from the
8 public domain and Federal lands of the United States, a
9 timetable for the execution of such a program, and an
10 accompanying report which specifies in detail:

11 (a) the present and projected levels of domestic
12 coal production and the anticipated domestic demand
13 if the country converts all new and, where feasible,
14 existing electrical utilities and heavy industrial boilers
15 from the use of oil and natural gas to coal;

16 (b) the need, nature and extent of a direct Fed-
17 eral role in opening new mines, transportation systems
18 and otherwise engaging in activities to increase domestic
19 coal production;

20 (c) the location, type and extent of the recoverable
21 coal resources covered by the program;

22 (d) the adequacy and capacity of existing and
23 available facilities for production, transportation, and
24 processing the required coal;

25 (e) assessment of the need for new facilities re-

1 quired to extract, transport and process the required
2 coal;

3 (f) anticipated location of required production,
4 right-of-way, transportation and other facilities needed
5 to produce and transport the required coal; and

6 (g) procedures for consultation with affected
7 State and local governments.

8 SEC. 403. ENERGY TRANSPORTATION SYSTEMS.—(a)
9 The Board shall prepare a Federal Energy Transportation
10 System Improvement Program after consultation with the
11 United States Railway Association and the Department of
12 Transportation. The Federal energy transportation systems
13 improvement program shall consist of a legislative recom-
14 mendation for direct and indirect participation by the Federal
15 Government in programs to assure the development on an
16 urgent basis of new and the improvement of existing railroad
17 systems, coal slurry pipelines, oil and natural gas pipelines,
18 and other energy transportation systems necessary to assure
19 the timely, safe, and efficient movement of coal and other
20 fuels from mines and other production areas throughout
21 the Nation to electrical powerplants, industrial users, and
22 residential consumers.

23 (b) The Board's recommendations shall include a time-
24 table for the development of such transportation systems, and

1 an accompanying report which specifies in detail:

2 (1) an analysis and assessment of the present ca-
3 pacity and projected requirements for the Nation's rail-
4 roads and other energy transportation systems for the
5 transport of coal and other fuels from producing areas in
6 the Western States, Appalachia, and other areas to the
7 principal electric utility, industrial users, and other major
8 consuming markets throughout the Nation;

9 (2) deficiencies in the present railroad and other
10 energy transportation systems;

11 (3) the need, nature, and extent, if any, of a direct
12 Federal role in rebuilding railroad beds, improving and
13 developing new energy transportation systems, and
14 otherwise engaging in activities to facilitate the timely,
15 safe, and economical transport of domestic fuels;

16 (4) specific projects when needed for the improve-
17 ment, rehabilitation, or augmentation of existing rail-
18 road facilities, rights-of-way, rolling stock and opera-
19 tions required to assure the safe and efficient movement
20 of coal and other energy resources;

21 (5) specific projects for the establishment of new
22 railroad, pipeline, and other energy transportation sys-
23 tems;

24 (6) proposed arrangements with existing railroads
25 for the improvement and augmentation of their energy

1 transportation rights-of-way, facilities, and equipment;

2 (7) the location and extent of rights-of-way, facilities,
3 ties, and equipment included in the program;

4 (8) proposals for the coordination of existing rail-
5 road and other transportation system operations in fur-
6 therance of the objectives of this Act;

7 (9) estimates of the new employment opportuni-
8 ties to be created under the program, including number,
9 location, and nature of same, and recommendations for
10 necessary retraining programs; and

11 (10) an estimate of the amount of steel and other
12 materials the Board's recommendations would require,
13 including estimates of whether such requirements would
14 exceed production capacity for steel and other materials
15 in light of other demands on such resources.

16 SEC. 404. FEDERAL OIL AND GAS PRODUCTION PRO-
17 GRAM.—(a) The Board shall prepare a Federal Oil and Gas
18 Production Program, which shall consist of a legislative rec-
19 ommendation and a plan for the accelerated development
20 and production of oil and natural gas from the public domain
21 and Federal lands of the United States, including the Outer
22 Continental Shelf, and timetables for the execution thereof.

23 (b) The Federal Oil and Gas Production Program
24 shall include, but need not be limited to—

1 (1) provision for the development and production
2 of oil and gas under the direct management, supervision,
3 and control of designated agencies of the Federal Gov-
4 ernment;

5 (2) provision for joint ventures between the Fed-
6 eral Government and private industry for the develop-
7 ment and production of oil and gas resources;

8 (3) provisions establishing preferences for small
9 business and incentives for new entries and for inde-
10 pendent oil producers to participate in joint ventures
11 and other arrangements for the development and pro-
12 duction of oil and gas resources;

13 (4) provisions, if necessary, for cost sharing and
14 other incentives to maximize the participation of private
15 enterprise in the development or production of oil and
16 gas resources;

17 (5) provisions for the expansion of employment
18 opportunities and estimates of the manpower required
19 for oil and gas development ventures;

20 (6) identification of the areas proposed to be devel-
21 oped or produced, including the reasons for the pro-
22 posal and the location of the resources in reference to
23 other active or potential development and production
24 activities nearby;

25 (7) estimates of the volume and the current market

1 value of the oil and gas based on estimates of the recov-
2 erable volume in the area proposed for development or
3 production;

4 (8) the cost of producing the recoverable oil and
5 gas under the proposed plan;

6 (9) the anticipated location of production units,
7 offshore and other support facilities, rights-of-way,
8 pipelines, and other infrastructure necessary to develop,
9 produce and transport the oil and gas produced;

10 (10) the capacity of existing onshore and other
11 facilities and infrastructure to handle the anticipated
12 production of oil and gas;

13 (11) assessment of the need for new facilities or
14 infrastructure that may be required to handle the an-
15 ticipated oil and gas production, or otherwise to support
16 operations within the development area; and

17 (12) where appropriate, a statement of the rela-
18 tionship of the projected development with coastal zone
19 management programs being developed by any coastal
20 State for approval pursuant to section 305 of the
21 Coastal Zone Management Act of 1972 (86 Stat. 1280;
22 16 U.S.C. 1451 et seq.) and the coastal zone manage-
23 ment program of any State which has been approved
24 pursuant to section 306 of that Act.

25 SEC. 405. TRANSMITTAL OF PROGRAMS FOR CONGRES-

1 SIONAL AUTHORIZATION.—(a) No part of the programs
 2 authorized by this title shall be carried out until a report
 3 containing a full and complete description of that part of
 4 the program has been transmitted to the Congress, and the
 5 execution of that part of the program has been expressly
 6 authorized by legislation thereafter enacted by the Congress.
 7 (b) The Federal Coal Production Program, Federal
 8 Energy Transportation Improvement Program, and the Fed-
 9 eral Oil and Gas Production Program and the Board's rec-
 10 ommendations for legislation to implement said programs
 11 shall be submitted to the President for transmittal to the
 12 Congress not later than nine months after the effective date
 13 of this section.

14 TITLE V—GUIDELINES AND ADMINISTRATION

15 SEC. 501. GUIDELINES, STANDARD, AND REPORT TO
 16 ACCOMPANY PROPOSED ACTION PROGRAMS.—(a) Every
 17 proposed action program to increase the production of
 18 domestic energy resources which is developed by the Board
 19 pursuant to titles II, III, and IV for transmittal to the Con-
 20 gress shall be accompanied by an explanatory background
 21 report.

22 (b) In developing action programs to increase domestic
 23 energy exploration and production pursuant to titles II, III,
 24 and IV the Board shall consider and evaluate the impact of
 25 such proposed action programs on—

1 (1) attaining a greater degree of domestic energy
2 self-sufficiency;

3 (2) the quality of the environment and existing
4 Federal environmental guidelines and standards;

5 (3) the revenues to be received by the Federal
6 Government from the use and development of public
7 resources;

8 (4) employment, by industrial and trade sectors,
9 as well as on a National, regional, State, and local basis;

10 (5) the economic vitality of regional, State, and
11 local areas;

12 (6) competition in all sectors of the energy in-
13 dustry;

14 (7) small business;

15 (8) the fiscal integrity of State and local govern-
16 ments; and

17 (9) vital industrial sectors of the economy.

18 (c) The report required by this section shall—

19 (1) contain an evaluation of the impact of the
20 proposed program on the guidelines and standards set
21 forth in section 501 (b) ;

22 (2) contain a concise and accurate summary of the
23 comments, if any, of the entities identified for review and
24 comment in section 503 ;

25 (3) set forth in reasonable detail—

1 (A) a description of the actions proposed to
2 be taken;

3 (B) estimates of annual costs and revenues;

4 (C) proposed arrangements for organization
5 and financing; and

6 (D) other relevant information setting forth the
7 manner in which the program is proposed to be
8 carried out.

9 (E) exceptional, unique, or unusual condi-
10 tions that may require special treatment or pre-
11 cautions to protect the environment and insure safe
12 operation;

13 (F) the anticipated impact on the economic,
14 social, institutional structure of States and com-
15 munities affected by the program;

16 (G) an analysis of Federal statutes, regula-
17 tions, and authorities pertinent to the subject mat-
18 ter of the program and recommendations for the
19 maximum practicable utilization of departments,
20 agencies, and instrumentalities of the Federal Gov-
21 ernment, their authorities, personnel and other re-
22 sources, for the management and implementation
23 of the program;

24 (H) an analysis of pertinent statutes, regula-
25 tions, and authorities of State and local governments

1 affected by the program and recommendations for
2 arrangements with such governments for implemen-
3 tation of the program; and

4 (I) the recommended forms of Federal organi-
5 zation for the management, control and financing of
6 the program.

7 SEC. 502. FORMS OF FEDERAL INVOLVEMENT AND
8 FINANCIAL ASSISTANCE.—(a) Each proposed action pro-
9 gram to increase the production of domestic energy re-
10 sources developed by the Board pursuant to titles III and
11 IV of this Act may propose the utilization of any of the
12 forms of direct Federal involvement and financial assistance
13 set forth in subsection (b).

14 (b) In developing and recommending to the Congress
15 proposed action programs the Board shall recommend—

16 (1) the direct utilization of existing Federal
17 agencies, such as the Corps of Engineers, the Bureau
18 of Reclamation, the National Aeronautics and Space
19 Administration, the Department of Defense and other
20 agencies which have engineering, contract administra-
21 tion, and other skills and areas of expertise which are
22 underutilized and which could make an important con-
23 tribution in carrying out the purposes of this Act;

24 (2) the designation of Federal lead agency for the
25 conduct, supervision and implementation of the pro-
26 gram;

1 (3) the role to be played by private enterprise
2 and the nature of the relationship to and involvement
3 in the program; and

4 (4) the forms of financial assistance to be granted,
5 if any, and the terms and conditions thereof.

6 SEC. 503. REVIEW AND COMMENT.—(a) In order to
7 assure that proposed action programs to increase the produc-
8 tion of domestic energy resources reflect a full consideration
9 of the interests of other Federal agencies, and State and local
10 governments, a preliminary draft of the proposed action
11 program and accompanying report shall, prior to being trans-
12 mitted to Congress, be submitted by the Board for review
13 and comment to—

14 (1) the Energy Resources Council;

15 (2) the Governor of any State within which the
16 resource is to be developed is located;

17 (3) the Governor of each affected coastal State in
18 the case of proposed development on the Outer Con-
19 tinental Shelf; and

20 (4) the governing bodies of political subdivi-
21 sions within which the resource to be developed is
22 located or of adjacent areas in the case of the Outer
23 Continental Shelf.

24 (b) The Board shall establish procedures to insure that
25 a preliminary draft of the proposed action program and

1 accompanying report are publicly available for review and
2 comment by—

3 (1) organizations representative of private indus-
4 tries engaged in the exploration, development, produc-
5 tion, transportation, and marketing of fuels and energy;

6 (2) organizations representative of industrial users
7 of fuels and energy and to representatives of the electric
8 utility industry;

9 (3) labor organizations;

10 (4) organizations representative of the small busi-
11 ness community;

12 (5) organizations representative of environmental
13 groups;

14 (6) organizations representative of consumer in-
15 terests; and

16 (7) other interested organizations and members of
17 the public.

18 (c) In order to assure the timely submission of the pro-
19 posed action program to the Congress, the Board may pre-
20 scribe reasonable limitations on the time permitted for review
21 and comment: *Provided*, That no such time limitations shall
22 be less than thirty days.

23 TITLE VI—NATIONAL ENERGY PRODUCTION
24 TRUST FUND

25 SEC. 601. ESTABLISHMENT OF FUND.—To carry out

1 the provisions of this Act, there is hereby established in the
2 Treasury of the United States a special fund to be known as
3 the National Energy Production Trust Fund (hereafter re-
4 ferred to as the "Fund"). During the period commencing
5 July 1, 1975, and ending June 30, 1985, there shall be
6 covered into such Fund \$1,000,000,000 annually for fiscal
7 year 1976 and \$2,000,000,000 annually thereafter from
8 revenues due and payable to the United States under the
9 Outer Continental Shelf Lands Act (67 Stat. 462, 469), as
10 amended (43 U.S.C. 1338), which otherwise would be
11 credited to the miscellaneous receipts of the Treasury.

12 SEC. 602. APPROPRIATIONS AND USE OF REVENUES
13 IN THE FUND.—All revenues paid into the Fund shall be
14 used only to carry out the purposes of this Act. Revenues
15 covered into the Fund shall be available for expenditure only
16 when appropriated therefor by the Congress. Any revenues
17 not appropriated shall remain available in the Fund until
18 appropriated for said purposes: *Provided*, that appropria-
19 tions made pursuant to this paragraph may be made with-
20 out fiscal year limitation.

21 SEC. 603. BOARD'S AUTHORITY.—All revenues ap-
22 propriated from the Fund shall be available to the Board
23 for expenditure or transfer to other Federal agencies to
24 achieve the purposes of this Act.

1 TITLE VII—ADVISORY COMMITTEES AND
2 INTER-AGENCY COORDINATION

3 SEC. 701. SPECIAL ENERGY ACTION PROGRAM AD-
4 VISORY COMMITTEES.—(a) With respect to each domestic
5 energy production action program proposed by the Board,
6 the Board is authorized and directed to establish special
7 program advisory committees which shall consult with the
8 Board during the development of the program and shall
9 provide advice and informaation to the Board concerning
10 all aspects of the program, including the relationship of the
11 program to the interests represented by the members of such
12 special committees.

13 (b) The special program advisory committees shall
14 provide for the representation of the following interests and
15 such other interests as the Board may deem necessary or
16 desirable:

17 (1) State and local governments;

18 (2) representatives of affected elements of the en-
19 ergy industry;

20 (3) representatives of affected elements of the
21 transportation industry;

22 (4) representatives of affected elements of the
23 public utility industry;

24 (5) representatives of affected elements of industrial
25 energy users;

- 1 (6) representatives of labor;
2 (7) representatives of small business;
3 (8) representatives of environmental organizations;
4 and
5 (9) consumer representatives.

6 (c) The special program advisory committees authorized
7 by this section and such other advisory boards, committees,
8 and councils as may be established by the Board shall be sub-
9 ject to the provisions of the Federal Advisory Committee Act
10 (86 Stat. 770, title 5 App. U.S.C.).

11 SEC. 702. INTER-AGENCY COORDINATION.—(a) The
12 Energy Resources Council (42 U.S.C. 5818) shall provide
13 assistance to the Board at the Board's request and shall be
14 responsible for insuring communication and coordination
15 among the Departments and agencies of the Federal Govern-
16 ment which are assigned responsibilities for the implementa-
17 tion and administration of action programs to increase do-
18 mestic supply pursuant to titles II, III, and IV of this Act.

19 (b) The President shall designate such additional mem-
20 bers and ex-officio members from Federal Departments and
21 agencies to serve on the Energy Resources Council as are
22 necessary to carry out the provisions of this Act.

23 (c) Members of the Energy Resources Council shall,
24 upon request of the Board—

- 25 (1) initiate proposals for additional domestic

1 energy action programs to achieve the purposes of this
2 Act;

3 (2) review and make recommendations to the
4 Board respecting action programs proposed by the
5 Board for achieving the purposes of this Act;

6 (3) utilize the resources and expertise of their
7 respective agencies in the formulation and review of pro-
8 grams to achieve the purposes of this Act; and

9 (4) undertake such additional related tasks as the
10 Board may direct.

11 TITLE VIII—GENERAL PROVISIONS

12 SEC. 801. SEPARABILITY.—In any part of this Act is
13 declared unconstitutional, or the applicability thereof to any
14 person or circumstances is held invalid, the applicability of
15 such part to other persons and circumstances and the consti-
16 tutionality or validity of every other part of the Act shall not
17 be affected thereby.

18 SEC. 802. EFFECTIVE DATE; TERMINATION DATE.—

19 (a) This Act shall take effect on the date of its enactment:
20 *Provided*, That sections 301, 302, 303, and 405 shall take
21 effect on the date that a majority of the members of the
22 National Energy Production Board enter upon their offices.

23 (b) This Act shall terminate September 30, 1980.

The CHAIRMAN. I think we are fortunate to launch these hearings and to start our effort with an outstanding panel of witnesses.

First, I would like to introduce the witnesses and then we will call on each of them to make their statement. When they have finished, we can then ask questions. I think this would be the most effective way.

We have, first, Secretary Henry Fowler; better known as Joe Fowler, who as Secretary of the Treasury assembled a long and distinguished record. He was in the Office of Mobilization in both the Korean and Second World War. He was the head of the Office of Defense Mobilization during the Korean war and was Assistant General Counsel in the War Production Board in World War II.

Associated with him in that effort is Mr. Falck, who is at his left.

Leonard Woodcock, who is a great leader in organized labor. A man who has taken keen personal interest in the economic well-being of this country, and who has made some outstanding recommendations to improve our economy. He has been involved on the labor side of mobilization efforts and is well equipped to speak on this subject.

Bob Nathan, who was on the War Production Board as one of its top economists in World War II and who is a distinguished economist of national and international repute.

All three witnesses have been involved in mobilization efforts.

Mr. Felix Rohatyn, who is testifying this morning on the House side, will join us a little later. Mr. Rohatyn is a distinguished investment banker from Wall Street.

I think that provides a pretty fine panel. So, we'll call first on Secretary Fowler, and then Mr. Woodcock, and then Mr. Nathan, in that order.

Secretary FOWLER. Thank you, Mr. Chairman. I will dispense with the reading of parts of my statement here.

The CHAIRMAN. Gentlemen, I want you to know that you may proceed in any way you like. You can put the whole statement in the record. You can read it into the record, and then summarize it using your own judgment.

STATEMENT OF HON. HENRY H. FOWLER, FORMER SECRETARY OF THE TREASURY

Secretary FOWLER. I would direct my remarks to the organizational aspects of the energy problem. This energy situation gives rise to a very commendable search for better, improved organizational efforts which are exemplified in the bill that you've introduced.

We need to have organization that is adequate to meet the problem. The findings of fact in section 2 of S. 740 to create the National Energy Production Board summarize the mountains of evidence which have accumulated in recent years on our energy problem. It has literally been studied to death.

But, positive concrete action following upon this flow of words and paper has been all too little and all too late.

It has become clear that the international imperatives, that is cohesion among the democratic industrialized countries, and a more cooperative attitude of oil producer countries depend upon what the

United States does about its own energy problem. It is only against a backdrop of an effective action program by the United States that we can meet our own problem and give effective leadership for a joint effort of the major oil importing nations.

But instead of effective action in the United States in the field of additional production and conservation we have witnessed months and months marked mainly by rhetorical flourishes.

In the words of the report on "World Energy and U.S. Leadership", by the Atlantic Council Energy Committee of which I was the Chairman, and which I will offer as an exhibit for the record in full, it was said:

In a situation that obviously required a major conservation effort, a reduction in imported oil, increased use of indigenous coal and oil and gas, and increased production of electricity from nuclear power plants, the United States tried to handle conservation by exhortation, imported more oil in 1974 than in 1973, used more oil to produce electricity in 1974 than in 1973, produced and used no more of its own coal in 1974 than in 1973, or in the 1940's for that matter, did little to encourage exploration and more production of domestic oil and gas or coal, and saw its nuclear power program go sour.

[The publication submitted by Secretary Fowler appears in the appendix, p. 231.]

Secretary FOWLER. So, in the light of the experience of this last year and a half it seems clear that we must have strong industrial and governmental institutions charged with responsibility for energy supply and use and more effective results oriented interaction between industry and government.

There are some lessons of experience relevant to the energy problem to be learned, as the chairman has referred, from the two most recent historical efforts to organize massive national production and supply programs in conjunction with World War II and the so-called Korean war mobilization.

Prior to and during World War II the Congress gave the President the necessary powers to effect the mobilization of our resources which he in turn delegated to the Office of Production and Management, soon to become the War Production Board, and the Petroleum Administration for War.

This country was able within 3 or 4 years to create and complete the Manhattan project for the manufacture of the components needed to make the first atom bomb; to construct a brandnew synthetic rubber industry to replace the raw rubber supplies that had been cut off; to construct the Alcan Highway to Alaska; to complete both the Big Inch and the Little Inch oil pipelines; to produce unprecedented numbers of warplanes, ships, tanks, guns, munitions, and communications equipment and to greatly expand the availability of the supplies of key materials, plants and facilities necessary to war production and the maintenance of essential civilian supply.

After a somewhat halting beginning of this process in 1940, with the creation of what we call the National Defense Advisory Council, which lacked the teeth, authority and the bite to do the necessary, Congress delegated the powers contained in the Second War Powers Act and related legislation, such as that providing for the rapid amortization for tax purposes of defense plant construction to a new agency, the Office of Production Management.

The year 1941 was marked by a series of reorganizations which moved consistently in the direction of concentrating all the authority available to the President in what became, after Pearl Harbor, the War Production Board.

That Board consisted of its Chairman, who was appointed by the President and the heads of the Government's most important war agencies. What is more significant is that by the Executive order that established the War Production Board, and the other executive agencies, extensive powers over production and supply were vested in the Chairman of the Board, not in the Board itself. The Chairman was required to exercise these powers with the advice and assistance of the members of the Board.

I refer my statement to the well documented extensive history of this effort which is in a 1,000 page book entitled "Industrial Mobilization for War; History of the War Production Board and its Predecessor Agencies", which I know is available to the committee.

This history is richly relevant to our current organizational dilemma in the energy field. There is no more startling example of the value of learning from the lessons of experience than that which was provided by the performance of the national Government when confronted by the outbreak of hostilities in Korea.

There was immediate recognition of the necessity for another more limited mobilization for the purpose of supplying our Forces and the U.N. Forces in Korea and, at the same time, putting America's mobilization base back in place after its deterioration in the years between 1945 and 1950.

With many individuals in key places in Congress and the executive branch and the private sector, who had had vivid experiences in World War II organization of production and supply, and the erstwhile chairman of the Senate Truman committee occupying the Presidency, an adaptation of the proven machinery for organizing production and supply on a massive scale was put quickly into place.

Within 3 months of the outbreak of hostilities in 1950, Congress had devised and enacted the Defense Production Act of 1950. This act, with related rapid tax amortization provisions and authority to enter into long-term material supply contracts for stockpiling, encouraging additional production capacity and other supply purposes, resulted through the proven process of organization in massive expansions of essential materials and facilities to determined goals.

These expansions with temporary accompanying conservation gave the United States the ready capability to produce a broad range of critical materials, products and services that would have been in short supply for defense and essential needs.

In the event of a broader war than that being waged in South Korea, these expansions would have been crucial to the maintenance of an ongoing economy.

By Executive order, the President's authority over production and supply were delegated to the Director of the Office of Defense Mobilization. The Director's authority was not limited to exhortation, drawing plans, devising options, or soliciting coordinated activity from other governmental departments and agencies. He was given authority by the President, "to direct, control, and coordinate" the actions necessary to assure adequate production and supply.

The Office of Defense Mobilization with the subordinate agencies, the Defense Production Administration, the National Production Authority in the Department of Commerce, and specialized offices in certain of the other departments, provided points where authority to act and take decisions was centralized.

Once again there was a special arrangement for oversight. A joint committee on defense production was created by the Defense Production Act of 1950 to oversee production and supply, leaving to standing committees their traditional responsibilities for the processing of specific legislation.

This joint committee provided a very useful focus for coherent congressional decisionmaking on production, supply and use matters.

In the light of the history of these experiences, I would like to make several observations on some of the contributing causes to the very large gap which has developed between our needs and aspirations in the field of energy and the actual accomplishments to date.

Some of the causes for this gap are: (1) the absence of adequate authority delegated by the Congress to the President to deal with the situation. Whether this absence is due to the failure of the Executive to ask for the authority or of the Congress to grant it is not for me to say. The fact is that the types of specific authority represented in the various sections of the original Defense Production Act of 1950 shaped and adapted to the energy problem with related tax amortization and financing tools do not rest in the hands of the President.

(2) There has been a failure by the President to delegate to a single official or agency the final decisionmaking authority relating to energy production, supply and conservation that exists in scattered fragments throughout the executive branch.

(3) There is an absence of a specific program of results fixed according to a precise timetable of quarterly and annual goals in both production and conservation of energy. We have had many studies and reports but no action program.

Many of the issues that must be decided if progress and achievement of an action program is to become a reality are yet unresolved and there is no fixed responsibility for achieving their resolution.

We have had opinions galore but opinions are not a determined program. In essence, we lack a point of decisionmaking in the Federal Government.

(4) There's no "one stop" agency for the approval and expediting of major energy programs and projects with directive authority over all the agencies involved through whom the elements of any action program can be effected.

To the private sector which must actually carry out most of these programs and projects, the Federal Government seems a jungle of decentralized authority and responsibility.

Where does a sponsor of an additional source of energy go in Washington? To the Environmental Protection Agency topped by the Environmental Quality Council for approval.

To the Nuclear Regulatory Agency for approval.

To the Federal Power Commission for a license.

To the Department of Interior if the leasing of mineral and fuel resources on Federal lands, onshore and offshore, is involved in the project.

To the State regulatory agencies and State officials for local permits.

Suppose financing is a handicap which market forces cannot overcome—where does one go?

Suppose there is a need to shorten the time cycle for the project—where does one go?

Suppose there is need to coordinate the decisional authorities to accelerate the time for processing various applications for governmental licensing, certificate, and permit procedures—where does one go?

Suppose there is need for eliminating shortages and delays in supplying skilled manpower, equipment, components, and material of specialized types—where does one go?

Suppose there is need to minimize design changes during construction or standardize special types of equipment to avert delays and shortages—where does one go?

These are the kinds of questions which are vital to the several thousand utility systems and their 200 million electricity users.

They can get lots of statistical forecasting but not much affirmative programing and expediting of energy needs and supply scheduling.

(5) There is an absence in the Federal establishment of an affirmative know-how agency to get the necessary things done that need to be done to increase energy production from both conventional and non-conventional sources or implement conservation programs.

Most of the Federal authority that exists in the field of energy is in the licensing or regulatory agencies, which are basically negative in their authority, purposes, and function. They can stop or hold up action but not initiate or expedite it.

The War Production Board in World War II and the Office of Defense Mobilization and its underlying defense agencies in the Korean war were affirmative in their responsibilities. It was their job to lay out the needed program and see that the obstacle were removed, pursuant to laws and policies enacted by the Congress with supervisory responsibility inherent only in the President himself.

There is no practical reason why this country cannot do as well today in coping with the energy problem as it did in the years 1940-45 and 1950-53 in coping with much more difficult problems that affected not only energy production and supply but practically all elements essential to the economy.

But to do so, there must be the will and there must be an organization adequate to the needs. Today either there is not the organization or, if it exists, there is not the will to use it.

That is why the first report released by the Atlantic Council Energy Committee early in January recommended:

The Administration and Congress should arrange urgently to concentrate in a single all powerful agency reporting directly to the President, all of the government's authority to act on production of energy, whether through changes in the economic and legal climate to accelerate investment, expedited regulatory decisionmaking, or direct action by government. What is needed in Washington is the organization of the Federal government to assure the availability of enough energy to satisfy our national needs and our national interest in international energy cooperation and avoid inadequacy of energy supply whether threatened by the pluralistic processes of the marketplace, divided authority in public regulation, or action by the oil producer's cartel.

In a subsequent report released by the Atlantic Council Energy Committee early in February, is another quote. It is quoted in my statement, but I will omit it here for the sake of brevity.

There may be those who would have a vague fear that this type of affirmative Government action would lead to nationalization or socialization.

That did not happen after World War II and the Korean mobilization program. Indeed, to the contrary, American business and industry emerged even stronger with the cooperation between Government and the private sector on a higher plane than before.

The real threat of nationalization is more likely to come only if the private sector, through its own fault or because of the failure of Government to provide a suitable environment or a combination of the two, fails to respond adequately to the national interest.

Or again, there may be those who will say, no, not one more agency.

This proposal is not just for one more agency. It is a proposal to convert the thousands in the Federal bureaucracy who are studying the energy problem and preparing various options for dealing with it into the hundreds who would act to do something about it.

The Office of War Utilities in the War Production Board was only approximately 500 in personnel. I would hazard a guess that the energy staffs in the FEA, Interior, Treasury, Commerce, and State Departments greatly exceed that number.

Mr. Chairman, I would not attempt to lay out a detailed blueprint for the precise organization or the exact clauses in the appropriate statute or Executive order. That would be presumptuous and counterproductive.

But, in closing, I would call your attention to some short overall descriptions of the functions of the Office of War Utilities, the Petroleum Administration of War, and the Solid Fuels Administration as contained in volume I of the Federal Records of World War II on Civilian Agencies. They are attached as an appendix to this statement.

Three divisions of this type with an integrating programing and policy staff reporting to a director possessed of the same status and authority as that confided in the Director of the Office of Defense Mobilization in the Korean mobilization should provide an organizational approach that would be far more results oriented than the present arrangements.

Given this setup and a broad mandate from the Congress to the executive similar to that given during the Korean mobilization, but referable and related only to energy production and supply, I would have every confidence that far more effective interaction between industry and Government would follow.

This interaction should enable the Nation to arrive at an expeditious and constructive solution of our domestic energy problem that is so vital to our security and economic future and so essential to international order and peaceful progress.

Thank you.

[The prepared statement, with attachment, of Secretary Fowler follows:]

Statement of Henry H. Fowler
Partner, Goldman, Sachs & Co.
March 20, 1975.

My name is Henry H. Fowler. I am a General Partner of
Goldman, Sachs & Co., an investment banking firm in New York City.

I am here at the request of the Chairman to discuss some of the
organizational aspects of the energy problem facing the United States.
Given the nature of the topic under consideration I should note some
of my credentials to advance some views on this subject.

It was my privilege to participate in two of the most significant
efforts in the last half century to organize massive national production
and supply to meet extraordinary challenges to our national security
and economic system. I refer to the national economic and industrial
mobilizations for World War II and the Korean War with its accompanying
reinstitution of an adequate national security base in 1950-1952.

From September 1941, three months before Pearl Harbor, until
February 1944, I was an Assistant General Counsel of the Office of Pro-

duction Management and the War Production Board. From February 1944 until September 1944 I was stationed in London as Economic Advisor to the U.S. Mission for Economic Affairs concerned with the coordination of the U.S. war production and supply effort with that of the British Empire, Canada and the exile governments. From September 1951 until January 1953 I held various posts in the so-called Korean mobilization, including Administrator of the National Production Authority and the Defense Production Administration and Director of the Office of Defense Mobilization. In the last mentioned assignment which I held for only five months I served as a member of President Truman's Cabinet and the National Security Council.

As Undersecretary of the Treasury under President Kennedy for three and a half years and Secretary of the Treasury under President Johnson for nearly four years, I had some familiarity with governmental organizational problems of the 1960's, including the responsibility for the coordination of various programs to deal with our international balance of payments.

Finally, as the current Chairman of the Board of Directors of the Atlantic Council of the United States, I am also serving as Chairman of its Energy Policy Committee, established in January 1974 to consider the problems of national coordination and international cooperation in the field of energy. I submit for the record as exhibits three reports which have been released by this Committee of the Atlantic Council entitled respectively "World Energy and U.S. Leadership", "Financing Free World Energy Supply and Use", and "A Call for Leadership".

I am accompanied here by one of my colleagues in the War Production Board, Mr. Edward Falck, who is an active Energy Consultant in Washington. Mr. Falck was the Director of the Office of War Utilities in the War Production Board and is the living person with the fullest experience on how the nation organized to meet the electricity and gas production and supply problems before and during World War II.

Because they are of great interest and relevance to the current

energy supply problems I offer for the record two articles authored by Mr. Falck which appeared in Public Utilities Fortnightly - one dated July 6, 1944, entitled "Mobilizing the Utilities For War" and the other dated December 6, 1973 during the recent oil boycott entitled "What Washington Should Do In the Energy Crisis". I particularly commend for your consideration to-day the discussion in the December 6, 1973 article under the heading "Lessons For Today".

In making the following observations I would like to make it clear that I am appearing solely in my personal capacity and am not speaking on behalf of the firm with which I am associated or the Atlantic Council.

The national energy situation, which gives rise to a search for organizational efforts, adequate to meet the problem, needs no elaboration from me. The findings of facts pertained in Section 2 of S740 to create a National Energy Production Board summarize the mountains of evidence

which have accumulated in recent years on our energy problem. It has literally been studied to death.

Presidential messages, Congressional reports, Executive Department reports and countless reports from the private sector emphasize that an effective U.S. energy program to offset long range supply imbalances and reduce critical vulnerabilities is an urgent object of domestic governance and international policies.

But positive concrete action following upon this flow of words and paper has been all too little and too late.

This long festering problem was brought to a dramatic crisis by the oil boycott and the four-fold price increase for crude oil in late 1973. It became clear that the abrupt ending of the era of cheap energy and changes in the financial situation of the producing and consuming nations constituted not only serious dangers for the world's trade and payments system but also for the cohesion of the democratic industrialized nations upon which their

security and prosperity depend. It also became clear that the international imperatives - cohesion among the democratic industrialized countries and a more cooperative attitude of the oil producers - depend upon what the United States does about its own energy problem. It is only against this backdrop of an effective action program by the United States that we can meet our own problem and give effective leadership for a joint effort of the major oil importing nations.

But instead of an effective action in the United States in the field of additional production and conservation we have witnessed months and months marked mainly by rhetorical flourishes. In the words of the Atlantic Council Report on "World Energy and U.S. Leadership":

"In a situation that obviously required a major conservation effort, a reduction in imported oil, increased use of indigenous coal and oil and gas, and increased production of electricity from nuclear power plants, the United States tried to handle conservation by exhortation, imported more oil in 1974 than in 1973, used more oil to produce electricity in 1974 than in 1973, produced and used no more of its own coal in 1974 than in 1973 (or in the 1940s for that matter), did little to encourage exploration and more production of domestic oil and gas or coal, and saw its nuclear power program go sour."

In the light of the experience of the last year and a half it seems clear that we must have strong industrial and governmental institutions charged with responsibility for energy supply and use and more effective results - oriented interaction between industry and government.

There are some lessons of experience relevant to the energy problem to be learned from the two most recent historical efforts to organize massive national production and supply programs in conjunction with World War II and the so-called Korean War mobilization. Prior to and during World War II the Congress gave the President the necessary powers to effect the mobilization of our resources which he in turn delegated to the Office of Production and Management, soon to become the War Production Board, and the Petroleum Administration for War. This country was able within three or four years to create and complete the Manhattan Project for the manufacture of the components needed to make the first atom bomb; to construct a brand new synthetic rubber industry to replace the raw rubber supplies that had been cut off; to construct the Alcan Highway to Alaska; to complete

both the Big Inch and the Little Inch oil pipelines; to produce unprecedented numbers of war planes, ships, tanks, guns, munitions and communications equipment and to greatly expand the availability of the supplies of key materials, plants and facilities necessary to war production and the maintenance of essential civilian supply.

This entire program was carried out with the cooperation of experienced industrial and business executives, engineers, scientists and government administrators working together for a common cause. The operation of the Office of Production and Management and War Production Board and related agencies were always under the surveillance of a watchdog Congressional Committee - the celebrated Truman Committee.

After a halting beginning of this process in 1940, with the creation of the National Defense Advisory Council, which lacked the teeth, authority and bite to do the necessary, Congress delegated the powers contained in the Second War Powers Act and related legislation, such as that providing for the rapid amortization for tax purposes of defense plant construction,

to a new agency, the Office of Production Management. The year 1941 was marked by a series of reorganizations which moved consistently in the direction of concentrating all the authority available to the President in what became, after Pearl Harbor, the War Production Board.

The Board consisted of its Chairman, who was appointed by the President and the heads of the government's most important war agencies. What is more significant is that by the Executive order that established the War Production Board, and other executive agencies, extensive powers over production and supply were vested in the Chairman of the Board, not in the Board itself. The Chairman was required to exercise these powers with the advice and assistance of the members of the Board.

The well documented history of this organizational effort in the most far reaching emergency mobilization of resources for production and supply ever to take place is contained in a 1000 page book, published in 1947, by the Civilian Production Administration which is entitled "Industrial Mobilization for War; History of the War Production Board and

Predecessor Agencies, Volume 1, Program and Administration".

This history is richly relevant to our current organizational dilemma in the energy field. There is no more startling example of the value of learning from the lessons of experience than that which was provided by the performance of the national government when confronted by the outbreak of hostilities in Korea. There was immediate recognition of the necessity for another more limited mobilization for the purpose of supplying our Forces and the U.N. Forces in Korea and, at the same time, putting America's mobilization base back in place after its deterioration in the years between 1945 and 1950. With many individuals in key places in Congress and the Executive branch and the private sector, who had had vivid experiences in World War II organization of production and supply, and the erstwhile Chairman of the Senate Truman Committee occupying the Presidency, an adaptation of the proven machinery for organizing production and supply on a massive scale was put quickly into place.

Within three months of the outbreak of hostilities in 1950, Congress had devised and enacted the Defense Production Act of 1950. (See 50 USCA App. Sec. 2061-2166, pp. 308-386). This Act, with related rapid tax amortization provisions and authority to enter into long term material supply contracts for stockpiling, encouraging additional production capacity and other supply purposes, resulted through the proven process of organization in massive expansions of essential materials and facilities to determined goals. These expansions with temporary accompanying conservation gave the United States the ready capability to produce a broad range of critical materials, products and services that would have been in short supply for defense and essential needs. In the event of a broader war than that being waged in South Korea, these expansions would have been crucial to the maintenance of an ongoing economy.

By Executive order, the President's authority over production and supply were delegated to the Director of the Office of Defense Mobilization. The Director's authority was not limited to exhortation, drawing plans, devising options, or soliciting coordinated activity from other governmental depart-

ments and agencies. He was given authority by the President, "to direct, control and coordinate" the actions necessary to assure adequate production and supply. (See Executive Order No. 10193 creating the Office of Defense Mobilization) 50 USCA app. page 364, Dec. 16, 1950, 15 F. R. 9031)

The Office of Defense Mobilization with the subordinate agencies - the Defense Production Administration, the National Production Authority in the Department of Commerce and specialized offices in certain of the other Departments, provided points where authority to act and take decisions was centralized. (See Executive Order No. 10161, 50 USCA app. page 315 and Executive Order No. 10200, 50 USCA app. pp. 364-368). Once again there was a special arrangement for oversight. A Joint Committee on Defense Production was created by the Defense Production Act of 1950 to oversee production and supply, leaving to standing committees their traditional responsibilities for the processing of specific legislation. (See 50 USCA App. Sec. 2162). This Joint Committee provided a very useful focus

for coherent congressional decision-making on production, supply and use matters.

The lessons of history in this Korean mobilization experience are readily available in the Quarterly Reports of the Director of Defense Mobilization, issued from the fall of 1950 through the spring of 1953. Historical summaries of the operations of the various organizational elements were prepared for reference purposes in any later mobilization efforts and are available in the National Archives or files in the old, but now regrettably defunct Office of Emergency Preparedness.

Parenthetically, let me interject that both Democratic and Republican Administrations have participated in a process of phasing out the standby planning facility represented in the Office of Defense Mobilization in the post Korean period. It was vastly compressed and scaled down to bare bones in the early 1960s under a Democratic Administration and practically phased out in 1973 under a Republican Administration.

In the light of the history of these two national experiences I would like to make several observations on some of the contributing causes to the very large gap which has developed between our needs and aspirations in the field of energy and the actual accomplishments to date. Some of the causes for this gap are:

1. The absence of adequate authority delegated by the Congress to the President to deal with the situation. Whether this absence is due to the failure of the Executive to ask for the authority or of the Congress to grant it is not for me to say. The fact is that the types of specific authority represented in the various sections of the original Defense Production Act of 1950 shaped and adapted to the energy problem with related tax amortization and financing tools do not rest in the hands of the President.
2. There has been a failure by the President to delegate to a single official or agency the final decisionmaking authority relating to energy production, supply and conservation that exists in scattered fragments

throughout the Executive Branch.

3. There is an absence of a specific program of results fixed according to a precise timetable of quarterly and annual goals in both production and conservation of energy. We have had many studies and reports but no action program. Many of the issues that must be decided if progress and achievement of an action program is to become a reality are yet unresolved and there is no fixed responsibility for achieving their resolution. We have had opinions galore but opinions are not a determined program. In essence, we lack a point of decision making in the Federal Government.

4. There is no "one stop" agency for the approval and expediting of major energy programs and projects with directive authority over all of the agencies involved through whom the elements of any action program can be effected. To the private sector which must actually carry out most of these programs and projects the Federal Government seems a jungle of decentralized authority and responsibility.

Where does a sponsor of an additional source of energy go in Washington?

To the Environmental Protection Agency topped by the Environmental Quality Council for approval.

To the Nuclear Regulatory Agency for approval.

To the Federal Power Commission for a license.

To the Department of Interior if the leasing of mineral and fuel resources on federal lands - on shore and off shore - is involved in the project.

To the state regulatory agencies and state officials for local permits.

Suppose financing is a handicap which market forces cannot overcome - where does one go?

Suppose there is need to shorten the time cycle for the project - where does one go?

Suppose there is need to coordinate the decisional authorities to accelerate the time for processing various applications for governmental licensing,

certificate and permit procedures - where does one go?

Suppose there is need for eliminating shortages and delays in supplying skilled manpower, equipment, components and material of specialized types - where does one go?

Suppose there is need to minimize design changes during construction or standardize special types of equipment to avert delays and shortages - where does one go?

These are the kinds of questions which are vital to the several thousand utility systems and their 200 million electricity users.

They can get lots of statistical forecasting but not much affirmative programming of energy needs and supply scheduling.

5. There is an absence in the Federal establishment of an affirmative know-how agency to get the necessary things done that need to be done to increase energy production from both conventional and non conventional sources or implement conservation programs. Most of the Federal authority

that exists in the field of energy is in the licensing or regulatory agencies.

which are basically negative in their authority, purposes and function. They can stop or hold up action but not initiate or expedite it. The War Production Board in World War II and the Office of Defense Mobilization and its underlying defense agencies in the Korean War were affirmative in their responsibilities. It was their job to lay out the needed program and see that the obstacles were removed, pursuant to laws and policies enacted by the Congress with supervisory responsibility inherent only in the President himself.

There is no practical reason why this country cannot do as well today in coping with the energy problem as it did in the years 1940-45 and 1950-53 in coping with much more difficult problems that affected not only energy production and supply but practically all elements essential to the economy.

But to do so there must be the will and there must be an organization adequate to the needs. Today either there is not the organization or, if it exists, there is not the will to use it.

That is why the first Report released by the Atlantic Council Energy

Committee early in January recommended:

"The Administration and Congress should arrange urgently to concentrate in a single all powerful agency reporting directly to the President, all of the government's authority to act on production of energy, whether through changes in the economic and legal climate to accelerate investment, expedited regulatory decision-making, or direct action by government. What is needed in Washington is the organization of the Federal government to assure the availability of enough energy to satisfy our national needs and our national interest in international energy cooperation and avoid inadequacy of energy supply whether threatened by the pluralistic processes of the market place, divided authority in public regulation, or action by the oil producer's cartel."

In a subsequent Report released by the Atlantic Council Energy

Committee early in February, this concept was expanded in the following

fashion:

"Equally important, the Free World international community will look to the U.S. for leadership only if the U.S. makes sense in the management and financing of its own energy supply and use program. This simply is not the case today.

The recent exemplary initiatives, such as the International Energy Agency, the International Energy Program, and the new international loan and guarantee facilities projected at recent international meetings in Washington, can be but misleading gambits unless backed up by and properly related to effective U.S. management of its own domestic energy supply and use system.

To that end the recommendation is made that the U.S. establish an Energy Supply Authority with the responsibility of expediting the development of the U.S. energy supply system, working through and with, and strengthening, the institutions, private and public, which can make short and near term contributions to increasing energy supply. The Energy Supply Authority would exercise its

authority to do what has to be done consistent with general policies and goals established by the President and approved by the Congress. It would have a life of, say five years. The Authority and its staff would consist of strong, experienced managers drawn from industry and government. It would be supply and use oriented. It would be results oriented.

In essence it would receive the direct delegation of powers from the President that the Congress would delegate to him to deal with domestic energy supply and use, on the scale and character of the powers delegated to the War Production Board in World War II and the Office of Defense Mobilization in the Korean War.

This recommendation is made with the belief that none of the existing or proposed U.S. government energy organizations is intended to assume clear responsibility for complete and integrated supply actions. Rather, responsibility and authority are fragmented and incomplete. Also, there is today within the U.S. Government (and state governments) much more responsibility and authority which tends to inhibit supply actions, rather than the other way around.

Organization by the House and Senate of a Joint Committee on Energy Supply and Use is recommended. Such a Committee could provide for badly needed focus and coherent Congressional decision-making on energy supply and use matters which require Congressional action.

This Committee would be comparable in its function and position to the Joint Committee on Defense Production created by the Defense Production Act of 1950 to oversee production and supply during the Korean War, and to the Joint Committee on Atomic Energy."

There may be those who would have a vague fear that this type of affirmative government action would lead to nationalization or socialization.

That did not happen after World War II and the Korean mobilization program. Indeed, to the contrary American business and industry emerged

even stronger with the cooperation between government and the private sector on a higher plane than before. The real threat of nationalization is more likely to come only if the private sector, through its own fault or because of the failure of government to provide a suitable environment or a combination of the two, fails to respond adequately to the national interest.

Or again, there may be those who will say - no, not one more agency.

This proposal is not just for one more agency. It is a proposal to convert the thousands in the federal bureaucracy who are studying the energy problem and preparing various options for dealing with it into the hundreds who would act to do something about it.

The Office of War Utilities in the War Production Board was only approximately 500 in personnel. I would hazard a guess that the energy staffs in the FEA, Interior, Treasury, Commerce and State Departments greatly exceed that number.

Mr. Chairman, I would not attempt to lay out a detailed blueprint

for the precise organization or the exact clauses in the appropriate statute or executive order. That would be presumptuous and counter-productive.

But, in closing, I would call your attention to some short overall descriptions of the functions of the Office of War Utilities, the Petroleum Administration For War, and the Solid Fuels Administration as contained in Volume I of the Federal Records of World War II on Civilian Agencies. They are contained in the Appendix to this statement.

Three divisions of this type with an integrating Programming and Policy staff reporting to a Director possessed of the same status and authority as that confided in the Director of the Office of Defense Mobilization in the Korean mobilization should provide an organizational approach that would be far more results oriented than the present arrangements.

Given this set-up and a broad mandate from the Congress to the Executive similar to that given during the Korean mobilization, but referable and related only to energy production and supply, I would have every

confidence that far more effective interaction between industry and government would follow. This interaction should enable the nation to arrive at an expeditious and constructive solution of our domestic energy problem that is so vital to our security and economic future and so essential to international order and peaceful progress.

APPENDIX

OFFICE OF WAR UTILITIES

[524]

This Office was formally established on February 13, 1943, for the purpose of unifying "the War Production Board's authority and responsibility for war utilities" and assuring "the adequacy of war utilities to meet demands of the war production program and essential civilian demands." To the Office were transferred the functions, records, and personnel of the Power Division and the Communications Equipment Division of the Office of the Director General for Operations; as well as those functions of the Facilities Bureau, the Facility Clearance Board, the Facility Review Committee, and the Resources Bureau that related to war utilities. These war utilities were the electric power, natural gas, manufactured gas, water, and steam heating industries, and the communications services (except radio). In the Office of War Utilities were concentrated nearly all the powers and responsibilities of the War Production Board insofar as they related to the utilities named above. The Directors of the Office were successively J. A. Krug, 1943-44, and Edward A. Falck, 1944-45.

The major functions of the Office were to estimate, on the basis of data obtained from Federal agencies, industry, and other sources, the supply of and the requirements for war utilities; to take steps to anticipate, forestall, and overcome shortages in the supply of war utilities by programming the use of existing facilities and by promoting the construction of additional ones wherever necessary; to develop and administer curtailment and allocation programs for war utilities in times and areas of shortage; to act as the claimant agency under the Controlled Materials Plan for materials required by war utilities; to see that supplies, materials, and equipment necessary to construct, operate, and maintain facilities for war utilities were scheduled, produced, and delivered on time; and to recommend to the War Production Board's Office of Production Research and Development the programming and execution of technical research and development activities designed to lead to the more efficient utilization of facilities and critical materials by war utilities.

By an administrative order of the Office, March 12, 1943, its organizational structure was set forth as described below. The Office was abolished on September 30, 1945.

Records.—Records of the Office, 1943-45, are in the Policy Documentation File. They include periodic activity reports, memoranda, bulletins, circulars, instructions, and other issuances of the Office; copies of summaries of telephone and other conversations of the Director; a typed "History of the Office of War Utilities and Predecessor Agencies, 1942-September 1945" (473 p. and appendices); and other papers relating to the organization, functions, personnel, and budget of the Office, 1943-45.

Records of the Office at Cameron, Va., include correspondence, memoranda, reports, and other records relating (1) to the production, allocation, distribution, supply, requirements, and curtailment of gas, electricity, and water in relation to essential war production, 1942-44; (2) to requirements of the Office for controlled materials under the Production Requirements Plan and the Controlled Materials Plan, 1942-44; (3) to the gas shortage of the winter of 1944-45, and the Power Conservation Program and other special utility programs, 1944-45; (4) to applications for authority to construct additional utility facilities and for priority assistance in obtaining materials and equipment for the maintenance and expansion of existing facilities, 1942-44; to lend-lease requisitions for power equipment and machinery for China and the Soviet Union, 1943-44; and (6) to the military deferment of key personnel and to other labor problems of war utilities, 1943-45. Present also are maps submitted with applications for proposed expansions of utility facilities, 1941-45; and records from the Director's office relating to the organization and administration of the Office and its predecessors, 1940-45.

STAFF BRANCHES

[525]

As organized in March 1943, the Office had five staff branches. The Administrative Branch handled general administrative services for the Office, including the maintenance of its central files. The Research and Statistics Branch assembled reports from the major utility companies; analyzed them and other data for the purpose of determining the supply and requirements of war utilities;

estimated future requirements for materials and equipment for the construction, maintenance, repair, and operation of utilities; and engaged in research projects concerning the fuel requirements of public utilities, the generating capacity of industrial plants, and other problems affecting the supply of and the requirements for utility services. The Materials Control Branch formulated Controlled Materials Plan policies and procedures for the Office of War Utilities and handled other matters relating to the plan. The Inventory Control Branch helped locate surplus materials or equipment and supervised the redistribution of these materials by the utilities materials redistribution staffs in the regional offices of the War Production Board. The Fuel and Allocations Branch prepared estimates of utility requirements for fuel and submitted them to fuel-supply agencies; and it coordinated the activities of the Office in administering programs for the allocation and conservation of utility services.

The Interagency Steering Committee for Developing a Broad Conservation Program was established about July 1943 to develop a comprehensive program of conserving manpower, materials, equipment, and fuel in war utilities so as to reduce to a minimum nonessential or wasteful activities that it was not feasible to eliminate by compulsory limitation orders.

Records.—Records of the branches in the Policy Documentation File include periodic activity reports and reports relating to excess inventories of utility companies and to the manpower situation in utility industries. There are also minutes of meetings of the Interagency Steering Committee for Developing a Broad Conservation Program and its subcommittees, 1943–45. Records of the branches at Cameron, Va., include correspondence, reports, minutes of meetings, and other materials relating to surplus stocks of equipment and materials in the hands of utility companies, 1942–44; and reports and related materials pertaining to the supply of war utilities, particularly gas, electricity, and water, for war production, 1942–45.

OPERATING DIVISIONS

[526]

The five operating divisions of the Office of War Utilities were the Power Division, the Manufactured Gas Division, the Natural Gas Division, the Water Division, and the Communications Division. With functions and organization similar to those of industry divisions they were responsible for mobilizing electrical power, central steam heat, manufactured and natural gas facilities, water supply, and the telephone and telegraph systems of the United States and for providing an adequate supply of these utilities for war industries, military and naval uses, and essential civilian uses. To carry out these objectives each division performed for those utilities that were under its jurisdiction the general functions and responsibilities of the Office of War Utilities. Each division estimated requirements within its field, determined the adequacy of existing facilities to meet these requirements, administered rationing and limitation and other orders programing the most efficient use of these facilities for approved purposes, approved and supervised the construction of new facilities as needed, and obtained and distributed materials and equipment required for new or existing facilities in accordance with the Controlled Materials Plan. Each worked with the appropriate divisional requirements committees, industry advisory committees, and appeals committees. The divisions existed, with little change, throughout the war period.

Records.—Selected records of the divisions in the Policy Documentation File include minutes of meetings of their staffs, 1943–45; periodic activity and technical utility reports, bulletins, and other issuances, 1942–45; minutes of meetings and other records of divisional requirements committees, industry advisory committees, appeals committees, and other committees, 1942–45; and other papers relating to the organization, functions, personnel, and budget of the divisions, 1943–45. Other records relating to the divisions are scattered throughout the file under appropriate subject headings; they include reports relating to the power situation, estimated effects of “brownout” orders on utility systems in the United States, fuel consumption of and storage data on electric utilities, the purchase of telephone and telegraph equipment, the program for expansion of power-production facilities of electric utility systems, and copper usage in minor cable extension, 1942–45.

Records of the divisions at Cameron, Va., include correspondence, memoranda, reports, and other records relating to the supply, requirements, and production of war utilities, 1942–45; to requests for assistance in obtaining materials,

equipment, and services, 1942-45; to requests to construct or alter utilities facilities, 1942-45; to the allotment by the divisions of controlled materials in accordance with the Production Requirements Plan and the Controlled Materials Plan, 1942-45; to the location of utilities, particularly in the United States and liberated and conquered areas of Europe, 1943-44; and to manpower problems in utilities industries, 1944.

The Water Division's "Engineering Reference File" (90 feet), containing information on water systems in the United States, and addressograph plates listing water and sewage utilities companies (94 trays) are in the custody of the Sanitary Engineering Division of the United States Public Health Service. Records containing data on war industrial loads, power supply, and operating coordination are in the custody of the Munitions Board. Records relating to the drafting of a proposed War Production Board Limitation Order to restrict the drilling of wells in areas of deficient ground-water supply are in the custody of the Interior Department's Geological Survey.

Records of the Communications Division, consisting of materials relating to communications utilities (464 feet), are in the custody of the Federal Communications Commission.

* * * * *

PETROLEUM ADMINISTRATION FOR WAR [922]

The Petroleum Administration for War, known also as PAW, was established by an Executive order of December 2, 1942, as successor to the Office of the Petroleum Coordinator for War. In addition to the general investigative and coordinative authority of its predecessor, the new agency was empowered and directed to (1) "establish basic policies and formulate plans and programs to assure for the prosecution of the war the conservation and most effective development and utilization of petroleum in the United States and its territories and possessions," and to "issue necessary policy and operating directives to parties engaged in the petroleum industry," provided that no such directive should conflict with directives issued by the War Production Board; (2) serve as liaison between units of the petroleum industry and Federal agencies in matters within its purview; (3) obtain from the appropriate Government agencies estimates of the amount of petroleum that would be required from the United States and its Territories and possessions to meet all military and essential industrial and civilian needs and compile and analyze such estimates and submit them to the War Production Board with recommendations for the allocation of petroleum to meet them; (4) recommend to the War Production Board estimates of the quantities and kinds of "controlled materials" needed by the petroleum industry to produce, refine, store, distribute (but not transport), or otherwise make available the amount of petroleum recommended by the Administrator for allocation; (5) exercise, subject to direction from the Chairman of the War Production Board, the authority conferred upon that official by issuing to the petroleum industry and enforcing such orders as the Administrator might deem necessary.

Immediately upon the cessation of hostilities with Japan the Petroleum Administration for War began to reduce its staff and to curtail its activity. An Executive order of May 3, 1946, provided for its formal termination of May 8, 1946.

The chief record-making units of the Petroleum Administration for War are described below as they existed in the middle of 1944.

Records.—Most of the records of the Petroleum Administration for War and its predecessors (3,066 feet) are in the National Archives. Of these, 2,679 feet are records of the headquarters offices and 387 feet are from the field. The fiscal and personnel records of the agency and certain records of temporary administrative value only are in the custody of the Oil and Gas Division of the Department of the Interior.

The central files of the Administration were never consistently developed. Only a very few of the staff and operating divisions made a practice of sending anything to them; and what they sent consisted mainly of routine correspondence, processed reports, press releases, administrative orders and bulletins, and carbon copies of outgoing letters. A few of the divisions maintained their own centralized divisional files; but the characteristic system of the agency was for each section to keep its own files, frequently in several distinct series.

See Petroleum Administration for War, *A History of the Petroleum Administration for War, 1941-1945*, edited by John W. Frey and H. Chandler (1946. 463 p.); and National Archives, *Putting PAW to Bed; or the Records Retirement Program of PAW* (1946. 14 p., processed). See also 35 monographs prepared by divisions and 11 monographs prepared by industry committees of PAW, in the Bureau of the Budget Library. These deal with construction, distribution, marketing, facility security, manpower, natural gas and gasoline, refining, production research, supply and transportation, budget and fiscal matters, and legal actions.

OFFICE OF THE ADMINISTRATOR

[1923]

Harold L. Ickes (May 28, 1941-February 15, 1946) and Julius A. Krug (March 18, 1946-May 8, 1946), as Secretaries of the Interior, served successively as Administrators of the Petroleum Administration for War; and under them Ralph K. Davies, Deputy Administrator, exercised full authority and discretion in directing the activities of the agency. The Deputy Administrator had assistants to coordinate the activities of the staff and operating divisions, to develop, analyze, and coordinate information pertaining to special administrative or research problems, and to handle other matters cutting across divisional lines. The Executive Secretary assisted in planning and integrating the work of the numerous internal and interagency boards and committees and supervised the work of the Graphic Section.

Records.—The records of the Administrator (7 feet) form a part of the wartime records of the Secretary of the Interior and consist chiefly of copies of outgoing letters signed by Secretary Ickes and the basic materials used in composing the letters. They are in the Office of the Secretary of the Interior. All other records of the Office of the Administrator are in the National Archives.

Records of the Deputy Administrator (184 feet) are in one general file and a number of comparatively small special series. Among the special series are sets of minutes of the Petroleum Industry War Council and of the district petroleum industry committees and subcommittees; transcripts of proceedings of conferences with representatives of the petroleum industry, of conferences on petroleum conservation, of the Federal Petroleum Council, of the National Conference of Petroleum Regulatory Authorities and district committees in 1942, and of meetings held by the Petroleum Coordinator with New England Governors and the Executive Committee of Mayors regarding the east-coast supply situation in 1942; periodic activity reports of the headquarters divisions and district offices; orders, regulations, and other documents relating to the Petroleum Administration's jurisdiction and policy; and records bearing upon the foreign petroleum situation, gasoline and petroleum stocks, losses of tanker tonnage, and technical oil missions.

The office records of the Deputy Administrator's several assistants (111 feet) include correspondence, memoranda, reports, and other papers on the 100-octane aviation gasoline program, crude oil prices, depletion taxes, the exploration of wildcat wells, draft deferment and other manpower problems of the petroleum industry, rationing, crude-oil production, and the sharing of facilities. Present also are special reports on major refinery projects; data on priorities, reconversion, and tax amortization; and monographs and other materials assembled for use in preparing the official history of the agency.

The records of the Office of the Executive Secretary (23 feet) include a master file of graphs and charts prepared for offices, divisions, committees, and boards of the Administration; and minutes, correspondence, reports, and other papers of the committees described immediately below and of the following committees: Chinese Petroleum Committee, Executive Committee of the Petroleum Administration for War, Foreign Crude Coordination Committee, and Domestic Operating Committee of the Petroleum Administration for War.

See Harold L. Ickes, *Fightin' Oil* (New York, 1943. 174 p.).

PETROLEUM BOARD

[1924]

This Board, successor to a similar body known as the Federal Petroleum Council, was established in February 1943 to coordinate the objectives, policies, and programs of the principal departments and agencies having an interest in petroleum. It was composed of the Administrator as Chairman and the Deputy Administrator of the Petroleum Administration for War and representatives of the State, War, and Navy Departments, the Reconstruction Finance Corporation,

the War Production Board, the Office of Price Administration, the War Shipping Administration, the Office of Defense Transportation, the Foreign Economic Administration, the Coordinator of Inter-American Affairs, the Office of the British Petroleum Representative, and the Federal Loan Agency. The Board dealt only with the major problems involved in the petroleum program, such as the over-all supply situation, the construction of refineries for 100-octane gasoline, and the relative importance of aviation gasoline and rubber in the allocation of common raw materials.

Records.—Minutes, correspondence, reports, and other papers of the Board are in the National Archives with records of the Office of the Executive Secretary of the Petroleum Administration for War.

FOREIGN PETROLEUM COMMITTEE

[925]

This Committee was established in February 1943 to coordinate the policies and programs of the principal Government departments and agencies concerned with foreign petroleum affairs. Its Chairman was the Deputy Administrator of the Petroleum Administration for War and its other members represented the State, War, and Navy Departments, the War Production Board, the Foreign Economic Administration, the War Shipping Administration, the Coordinator of Inter-American Affairs, and the Office of the British Petroleum Representative. The Committee set up a number of subcommittees to deal with special problems.

Records.—Minutes, correspondence, reports and other papers of the Committee are in the National Archives with records of the Office of the Executive Secretary of the Petroleum Administration for War.

PETROLEUM REQUIREMENTS COMMITTEE

[926]

This Committee, organized in July 1943, had full authority, subject only to an appeal to the Chairman of the War Production Board, to divide the available supply of petroleum products among the several claimant agencies. Its Chairman, acting for the Petroleum Administration for War, effected the allocation to these agencies according to the relative urgency and essentiality of their requirements. Other members of the Committee represented the War and Navy Departments, the War Shipping Administration, the Foreign Economic Administration, the Office of Defense Transportation, the War Food Administration, the War Production Board, the National Housing Administration, and the Office of Price Administration.

Records.—Minutes, correspondence, reports, and other papers of the Committee are in the National Archives with records of the Office of the Executive Secretary of the Petroleum Administration for War.

FOREIGN PETROLEUM MATERIALS COMMITTEE

[927]

This Committee, established in November 1942, later became a subcommittee of the Foreign Petroleum Committee. It coordinated interagency procedure for the procurement of petroleum materials and equipment for the foreign petroleum industry. A representative of the Administration's Foreign Refining Division served as Chairman. Other members of the Committee represented the State Department, the War Production Board, the Army-Navy Petroleum Board, and the Foreign Economic Administration.

Records.—Minutes, correspondence, reports, and other papers of the Committee are in the National Archives with records of the Office of the Executive Secretary of the Petroleum Administration for War.

FOREIGN PETROLEUM REQUIREMENTS COMMITTEE

[928]

This Committee was established in August 1944, at the suggestion of the War Production Board, to review and approve requirements of critical materials for carrying out programs that had been approved by the Foreign Petroleum Committee. The Foreign Petroleum Requirements Committee absorbed certain functions of the Foreign Petroleum Materials Committee, which was dissolved shortly afterwards. The Deputy Administrator of the Petroleum Administration for War was chairman of the new Committee and its other members represented the Department of State, the War Shipping Administration, the War Production Board, the Foreign Economic Administration, and the Army-Navy Petroleum Board.

Records.—Minutes, correspondence, reports, and other papers of the Committee are in the National Archives with records of the Executive Secretary of the Petroleum Administration for War.

PETROLEUM SUPPLY AND DISTRIBUTION BOARD

[929]

This Board, an outgrowth of the Tanker Coordinating Committee and the Tanker Control Board, was created in May 1942 to bring together representatives of Government agencies concerned with the world-wide transportation of petroleum. The Deputy Administrator served as Chairman of the Board, the other members of which represented the War and Navy Departments, the War Shipping Administration, and the British Petroleum Mission.

Records.—Minutes, correspondence, reports, and other papers of the Committee are in the National Archives with records of the Executive Secretary of the Petroleum Administration for War.

EUROPEAN PETROLEUM COMMITTEE

[930]

This Committee was established in March 1945 to coordinate the activities of various Government agencies in dealing with the petroleum problems of Europe in the postwar period. The Deputy Administrator was Chairman, and among the other members were representatives of the Army-Navy Petroleum Board, the Department of State, the War Shipping Administration, and the Office of the British Petroleum Representative.

Records.—Minutes, correspondence, reports, and other papers of the Committee are in the National Archives with records of the Executive Secretary of the Petroleum Administration for War.

PETROLEUM INDUSTRY WAR COUNCIL

[931]

This Council was established as the Petroleum Industry Council for National Defense in November 1941. It was a top-level industry body, comparable to the industry committees already functioning in the districts (see entry 950), which advised the Petroleum Administration for War on national policies and programs affecting the production, refinement, and distribution of petroleum. The Council, composed of members representing all branches of the oil industry, set up a series of subordinate committees, corresponding in a general way to the principal divisions of the Petroleum Administration for War, to deal with such phases of the petroleum problem as production, supply and transportation, distribution and marketing, refining, petroleum economics, natural gas and gasoline, conservation, manpower, national oil policy, renegotiation of contracts, disposition of Government-financed facilities, and the protection of petroleum facilities.

Records.—The records of the Council are in the custody of a trustee appointed by the Council, in New York City. Copies of its minutes are in the National Archives among the records of the Executive Secretary of the Petroleum Administration for War.

FOREIGN OPERATIONS COMMITTEE

[932]

This Committee, established in December 1941, was composed of the heads of the principal companies engaged in the petroleum industry in foreign fields. It was concerned chiefly with broad questions of the supply and transportation of petroleum; but it had a number of subordinate operating committees which dealt in detail with the problems of different geographical areas (the Caribbean, Latin America, Europe, North Africa, West Africa, the Near East, and the Far East), with special problems (such as materials, lubricating oil, and package goods), or with functions (such as refining and producing). Among its other activities the Committee and its subcommittees compiled information relating to petroleum production and refinery and terminal facilities in all parts of the world.

Records.—The records of the Committee are in the custody of a trustee appointed by the industry. Copies of some of its statistical compilations are among the records of the Foreign Production Division.

STAFF UNITS

ADMINISTRATIVE DIVISION

[933]

This Division handled the budgetary, fiscal, property, personnel, and other administrative functions of the agency. In February 1944 it was given the function of advising the Administrator on questions of organization that had formerly been performed by the Division of Organization Planning.

Records.—The records of the Division in the National Archives (342 feet) include the Executive Officer's general file of correspondence, memoranda, reports, and other papers dealing with such matters as budget, personnel procedure, military personnel assigned to the Administration, and records management. The records of the Organization Planning Division consist largely of correspondence, memoranda, and reports pertaining to the organization of the Washington and district officers and to the preparation and revision of the manual, *PAW Plan of Organization*. They include also correspondence, reports, and other materials pertaining to the records administration program of the Petroleum Administration for War. The fiscal and personnel records of the Administration are in the custody of the Oil and Gas Division of the Department of the Interior.

CONSTRUCTION DIVISION

[934]

The task of this Division was to ensure that authorized projects for the construction of refineries were completed in time to meet the Administration's program commitments. In achieving this objective the Division determined the requirements in equipment and materials for the construction, maintenance, and operation of needed domestic refineries; screened all refinery construction projects before they were presented to the War Production Board for approval; allotted materials and equipment to authorized refinery projects, transferring materials and equipment from one project to another when necessary to prevent delays; scheduled and expedited the manufacture and delivery of critical components and materials for all approved refinery projects; maintained inventory records of surplus, idle, and salvage refinery materials and equipment available for redistribution; and assisted builders and contractors in resolving labor, manpower, engineering, and planning problems. Originally created out of the Construction Section of the Refining Division in August 1943, the Division was abolished in December 1944 and its remaining functions were divided between the Refining Division and the Materials Division.

Records.—The records of the Division (137 feet) are in the National Archives. They comprise a large number of relatively small series, some of which were kept by a divisional files unit and the rest by the several sections. They include studies, tabulations, and reports on critical components; weekly and monthly reports of the Construction Division to the Refining Division; case files on priorities; program determinations issued by the War Production Board in regard to the rating of projects; minutes of the War Production Board's Power Requirements Committee; correspondence with manufacturers relating to procurement of pressure vessels and steel plate; lists of petroleum refiners; the minutes of the Materials Coordinating Committee of the Petroleum Administration for War; photographs sent in by refining companies to show progress on construction projects; and statements of claims for reimbursement for extraordinary expenses, with supporting data. Among the Division's records also are those parts of the correspondence file of the Refining Division that relate to the former Construction Section.

FACILITY SECURITY DIVISION

[935]

This division, in collaboration with the War Department's Provost Marshall General, the Coast Guard, the Federal Bureau of Investigation, the Office of Civilian Defense, and the petroleum industry committees, formulated plans and procedures and developed standards of security measures for the protection of petroleum facilities against sabotage, fire, explosion, and similar dangers. It directed the inspection of such facilities and assisted the Resources Protection Board of the War Production Board in evaluating their relative importance.

Records.—The records of the Division (18 feet) are in the National Archives. They consist chiefly of records relating to the prevention of sabotage and accidents in refineries. They include reports of refinery inspections and applications for priority preference ratings for protection equipment.

LEGAL DIVISION

[936]

This Division provided legal advice to all other divisions and offices of the agency and assisted the Deputy Administrator in assuring that the actions of the Petroleum Administration for War were consistent with the authority delegated to it. In achieving this objective the Division's staff prepared orders, directives, and regulations for issuance by the Administrator or, upon his recommendation, by other agencies; transmitted such orders for proper codification and publication in the *Federal Register*; and reviewed and approved, from a legal point of view, all outgoing documents of the Administration. The Division was also responsible for obtaining compliance with orders, directives, and regulations issued by the Petroleum Administration for War.

Records.—The records of the Division (70 feet) are in the National Archives. They include general correspondence of the Chief Counsel; a master file of the Administration's recommendations and directives with amendments, revocations, and related correspondence; closed compliance cases; correspondence about proposed seizures of plants; correspondence relating to claims filed under the plan of the Administration to share increased and extraordinary shipping expenses; and technical process licensing agreements.

OFFICE OF THE MANPOWER COUNSELOR

[937]

This Office developed and recommended policies and programs with regard to labor and manpower situations affecting the petroleum industry and was responsible for the development and maintenance of effective relations with labor organizations. The Counselor was the Administration's primary liaison representative with all Federal agencies and committees concerned with labor and manpower problems, including the National War Labor Board, the War Manpower Commission, the Selective Service System, the War Production Board, the War and Navy Departments, and the Manpower Committee of the Petroleum Industry War Council.

Records.—The records of the Office (10 feet) are in the National Archives. They consist largely of correspondence, memoranda, and reports pertaining to the policies of the Administration in reviewing requests of the industry for deferment of administrative and technical personnel from military service; tabulations of the number of deferments approved and disapproved; and correspondence with petroleum companies on matters concerning deferments, wages, disputes, furloughs, and "replacement schedules."

MATERIALS DIVISION

[938]

This Division was responsible for obtaining from the War Production Board and other Government agencies the allotments of materials and equipment required by the petroleum industry. It supervised the division of these allotments by the Petroleum Administration's Materials Coordinating Committee among the operating and construction divisions of the agency and the further apportionments by the responsible divisions among domestic petroleum operators according to the needs of their respective programs. This Division also acted as an industry division of the War Production Board for manufacturers of petroleum machinery and equipment and performed liaison functions between the industry and the Government with respect to materials. The Director of the Division represented the Petroleum Administration for War as a claimant agency on the War Production Board's Controlled Materials Board.

Records.—The records of the Division (150 feet) are in the National Archives. They include copies of the minutes of many agency and interagency committees, such as the Materials Coordinating Committee, the Foreign Petroleum Materials Committee, the War Production Board Urgency Rating Committee, the Facility Review Committee, and the district subcommittees on materials; correspondence with companies and district directors and other officials of the agency regarding the procurement of tractors; data relating to the allotment of materials to the Caribbean area; and records pertaining to the history of the Division.

PROGRAM DIVISION

[939]

This Division formulated petroleum-supply programs to meet the demands of the United States and its Allies; followed the progress of performance against approved programs and advised as to the significance of deviations in terms of program implications; and coordinated and integrated operating plans and schedules of the various divisions of the Petroleum Administration for War. It considered both long-term and short-term objectives, attempting to estimate probable oil requirements 6 to 18 months in the future and revising its estimates in detail to meet day-by-day changes in conditions.

In 1945, before a contemplated program revision had been completed, the end of the war in Europe and the resulting shift of emphasis to the need for fuel oil in the Pacific caused the Division to prepare a survey instead of the usual program. This survey indicated the total requirements and probable shortages in the future if supply could not be increased above the original estimates.

Records.—The records of the Division (13 feet) are in the National Archives. Among them are copies of its various programs and surveys, with the statistical data used in their preparation. The records also include correspondence, reports, and statistics relating to the petroleum needs of all regions of the world and data on tanker shipments and stocks of petroleum products available for the United States and foreign areas.

PUBLIC RELATIONS DIVISION

[940]

This Division, formerly called the Information Division, made available to the public, the oil industry, Congress, and interested Government agencies information as to the activities of the Petroleum Administration for War and worked to enlist the support of the public and the petroleum industry for the Administration's program.

Records.—The records of the Division (41 feet) are in the National Archives. They include a record set of the Administration's press releases and of speeches by its principal officials; daily news summaries submitted by the Public Relations Offices of Districts I, II, and III and summaries of news from Washington, New York, Philadelphia, and Baltimore newspapers, with clippings attached; weekly reviews of the oil-trade press and a record set of the *100 Octane Times*, which was published by the Petroleum Administration for the operating, maintenance, and construction workers in 100-octane gasoline plants; and photographic negatives that were taken chiefly in the Pacific war area to show the use of petroleum products.

RESEARCH DIVISION

[941]

This Division prepared and disseminated to the operating divisions of the Petroleum Administration, to other Government agencies, and to industry committees, basic current statistical data regarding the supply of and demand for critical petroleum products and current information and forecasts on tanker and barge construction, deliveries, movements, and losses. It analyzed and interpreted its information and directed the attention of the Deputy Administrator and other officials of the Administration to critical situations. It reviewed and approved or disapproved all forms proposed for use by the Administration in requesting information from the petroleum industry or the public. The Division was also responsible for safeguarding the distribution of all secret, confidential, and restricted information assembled by the Administration.

Records.—The records of the Division (23 feet) are in the National Archives. They include a complete series of its many reports on such subjects as petroleum stocks, inventories, supplies of civilian petroleum products, supplies of military petroleum products, tank-car shipments, a comparison of petroleum-supply programs with operations, tanker and barge shipments from the Gulf coast, exports from the continental United States and from noncontiguous territories to foreign countries, the United States tanker construction program, and tanker tonnage and tanker services. Also among these records are a series of general security regulations affecting the administration of the agency and its records, copies of all forms used by the Administration, and forms and questionnaires of other Government agencies relating to the operations of the Petroleum Administration for War.

OPERATING UNITS

DISTRIBUTION AND MARKETING DIVISION

[1942]

This Division was originally established as the Marketing Division in August 1941. In February 1944 its functions were clarified and its name was changed to the Distribution and Marketing Division. It directed the allocation and distribution of petroleum products to wholesale and retail distributors and to the various classes of consumers in accordance with their authorized priority and relative urgency. It assisted the Program Division in developing estimates of these requirements, except for aviation fuels and lubricants; coordinated and approved monthly allocation and distribution programs for each district; determined and designated to the Supply and Transportation Division the kind and quantity of products to be procured and delivered to specific distribution terminals and large-scale consumers; and administered programs for the conservation of petroleum products through the more efficient use of those products, the substitution of other products, the conversion of oil-burning units for the use of other types of fuel, or the restriction of less essential uses. The Division also handled all of the agency's problems pertaining to maldistribution, and it maintained liaison with the Office of Price Administration with respect to the rationing of petroleum products and to bulk and retail petroleum prices.

Records.—The records of the Division (44 feet) are in the National Archives. They include the Division's progress reports; correspondence regarding Office of Price Administration regulations affecting petroleum products; minutes of several committees and subcommittees concerned with petroleum and the minutes and report of the Committee to Determine the Economic Influences of the Impact of the War on the Petroleum Industry; correspondence of the Chief Engineer concerning heating equipment and the colloidal fuel program; records relating to gasoline shortages in various areas, rationing, and gasoline specifications; and statements of quarterly petroleum requirements submitted by claimant agencies.

NATURAL GAS AND NATURAL GASOLINE DIVISION

[1943]

This Division sought to promote, with a minimum investment of critical materials and manpower, a maximum production of natural gas, natural gasoline (and its derivatives), and liquefied petroleum gas to meet the needs of the war program. It maintained close relations with the industry, with the armed forces, and with State and Federal agencies to assure full and effective development and utilization of the country's natural gas and natural gasoline reserves and resources.

One of the Division's chief tasks was to encourage the search for and development of new reserves adjacent to transmission lines. It dealt with many problems in connection with the drilling for and field production of natural gas and condensate; reviewed proposals for the construction of plants to extract natural gasoline and its derivatives from natural gas; and compiled estimates of the anticipated production of natural gas, natural gasoline, and liquefied petroleum gas for comparison with estimates of demand obtained from other Government agencies, in order to determine areas where a shortage of production might seriously affect war production. The Division also prepared, in collaboration with the industry, programs for increased production to meet anticipated shortages; made estimates of material requirements for the industry, both for new construction and for repair and maintenance materials and operating supplies; and took the necessary steps to assure that natural gasoline and allied products were supplied to domestic refineries, as designated by the Refining Division, and were made available to meet other requirements as designated by the Supply and Transportation Division.

Cost, price, and financial studies were made by the Division as a basis for justifying its programs designed to stimulate exploration, development, and construction in the industry. These studies were also used in selecting, justifying, and certifying to the Defense Plant Corporation various Government-financed natural gas processing facilities and in making recommendations to the Treasury Department and congressional committees as to depletion allowances and other natural gas and natural gasoline tax matters. The Division advised the Office of Price Administration concerning the prices of natural gas and condensates.

Records.—The records of the Division (100 feet) are in the National Archives. They include reports on technical processes (especially the Houdry process for

producing butadiene), natural gas production and reserves, and liquefied petroleum gases; minutes of the natural gasoline committees and subcommittees in the five districts; gas pipe-line maps; and reports concerning gas systems. Minutes and other records of the district liquefied petroleum gas subcommittees are among the Division's records.

PRODUCTION DIVISION

[1944]

This Division's task was to ensure that the domestic petroleum industry produced the crude oil necessary for domestic refining requirements through the maximum utilization of existing production capacity and the development of necessary additional capacity and reserves. The Division developed, in collaboration with the Program Division, long- and short-term production programs; and it promoted efficient production operations, encouraged the effective development of known oil reserves and secondary recovery projects, determined the adequacy of known oil reserves in the United States to maintain essential war production, and encouraged exploration of new reserves. The Division also followed the progress of production performance in comparison with program commitments and made cost, price, and financial studies as a basis for recommendations to Government agencies and congressional committees with respect to crude oil prices, depletion allowances, and other tax matters. It assisted the petroleum industry in obtaining adequate supplies of materials and equipment and adequate manpower, and it made reclamation studies to determine whether oil-field materials and equipment already installed could not be placed in more efficient use.

The Conservation Division, which had been established in August 1941, was transferred in July 1942 partly to the Production Division and partly to the newly established Reserves Division. The Reserves Division was merged with the Production Division in December 1943.

Records.—The records of the Division (239 feet) are in the National Archives. They include correspondence, reports, and maps pertaining to most of the petroleum fields and pools in the United States; data on fields and pools in Canada, Mexico, and South America; weekly reports of production from district directors; correspondence concerning the establishment and the first meeting of the National Conference of Petroleum Regulatory Authorities; petitions for crude oil price increases; and statistics relating to crude oil reserves and the depletion of oil fields in the United States.

The Production Division maintained the Administration's official records pertaining to Petroleum Administrative Order 11, which restricted the use of materials in production operations. These records consist chiefly of applications for exceptions under the order and related papers. The central files of the former Reserves Division were transferred to the Production Division intact and form a unit among its records. The records of the former Conservation Division are interfiled among the records of these two divisions.

REFINING DIVISION

[1945]

This Division was responsible for seeing that adequate facilities were maintained or added to existing refinery equipment in order to ensure that the necessary quantities of petroleum war products were available for the armed forces, civilian war needs, and the United Nations. Its program was concerned with the technology of operations, the costing and pricing of projects and products, the correlation of refinery operations, the allocation of materials for construction and of crude petroleum for processing and the improvement of processes and products. One of its major functions was to negotiate contracts between producers and the Defense Supplies Corporation and between refiners and the Defense Plant Corporation. The Construction Section of the Refining Division was established as a separate division in August 1943. When the construction program was nearing completion in 1944, this offshoot division was abolished and some of its remaining duties were returned to the Refining Division.

The Aviation Officer of the Petroleum Administration, who had his office in the Aviation Section of the Refining Division, served as Executive Secretary for the Aviation Petroleum Products Allocations Committee, a subcommittee of the Munitions Assignments Board. This Committee, working in close conjunction with the Aviation Section, was responsible for the direct allocation of all aviation gasoline above 87-octane. The Aviation Gasoline Advisory Committee, composed

of industry men but representing the Petroleum Administration rather than their respective companies, operated virtually as an arm of the Refining Division. This Committee was established, with its office in New York, to solve various problems arising out of the deficient supply of aviation gasoline. Another committee important to the operations of the Division was the Technical Advisory Committee, a subcommittee of the Technical Committee of the Petroleum Industry War Council. As a group representative of the petroleum industry, this Committee functioned broadly to conduct or promote voluntary cooperative research and development work with respect to the manufacture and use of petroleum products for war.

Records.—The records of the Refining Division (481 feet) are in the National Archives. Most of them are in the Division's central files, which include correspondence, memoranda, reports, and other papers concerning the technical processes of petroleum refining, industry and other refining committees, process pooling, aviation gasoline, plant expansion, requirements for petroleum products blending agents, patents, and materials and equipment. This series also includes a complete set of reports of the Technical Advisory Committee and records pertaining to the administration of the Aviation Gasoline Reimbursement Plan, particularly with respect to the authorization of operations under that plan and the settlement of claims submitted under it.

There is a small series of the Refining Division's records, once a part of the central files of the Administration, concerning administration and personnel, conferences, industry refining committees, field offices, and the various operations of the Division. The records of the Division Director, which were separately maintained, include correspondence and complete sets of the Division's monthly progress reports and copies of the monthly "Aviation Gasoline Reports," which were submitted by the Petroleum Administration for War to the War Production Board. Among the lesser series of the Division's records are the correspondence, reports, and other papers of the Aviation Gasoline Advisory Committee and correspondence, reports, and related papers pertaining to the Aviation Officer's work as Executive Secretary of the Aviation Petroleum Products Allocations Committee. The records of the Committee proper are in the custody of the Office of The Adjutant General of the Army. These records contain documents relative to the allocation of critical aviation fuels.

SUPPLY AND TRANSPORTATION DIVISION

[946]

This Division was established in August 1941 as the Transportation Division. In February 1944 it was consolidated with the Supply Division, which had been created in March 1942, and its name was changed to the Supply and Transportation Division. The enlarged Division was responsible for seeing that the available quantities of crude oil and refinery products were procured and delivered to meet the requirements of (1) refineries designated by the Refining Division, (2) distribution terminals or large-scale consumers designated by the Distribution and Marketing Division, and (3) delivery points designated by the armed forces and other war-procurement agencies.

The Division assisted the Program Division in developing monthly supply programs; and it determined the requirements of the petroleum industry for mobile transport facilities to meet program commitments and presented and justified such requirements to the Office of Defense Transportation and the War Shipping Administration as a basis for their allotment of facilities to the industry. The Division also located and arranged definite sources of supply of specific petroleum products, other than aviation fuels, lubricants, toluene, and synthetic rubber raw materials, that were needed to meet the requirements of the armed forces and other war-procurement agencies, giving them information necessary for their negotiations and taking steps to ensure that deliveries were made on time. It selected projects for pipe lines, terminals, and related facilities to supply transport deficiencies, obtaining authorization for them and expediting their construction; developed plans for the maximum effective utilization of available motor trucks, tank cars, barges, and tankers and recommended such plans to the Office of Defense Transportation and the War Shipping Administration as a basis for the direction and regulation by them of the use of those facilities; and assisted the petroleum industry in obtaining adequate supplies of materials, equipment, and manpower to maintain and operate its transport facilities.

Records.—The records of the Division (172 feet) are in the National Archives. Those of the Director's office include correspondence with district directors and with the supply and transportation committees that operated in the districts, and reports, maps, and other documents pertaining to the operation of the 20- and 24-inch war emergency pipe lines (the Little Big Inch and the Big Inch), the Southwest emergency pipe line, and other smaller pipe lines. Other records of the Division include surveys of pipe-line facilities by districts, 1941; a series on aviation gasoline storage facilities, arranged by company and district, 1945; reports concerning tanker shipments and the tanker and barge construction programs; a report, "Survey of Oil Handling and Oil Bunkering Facilities at Ocean Ports, on the Great Lakes and Inland Waterways of the U.S.," prepared by the Board of Engineers for Rivers and Harbors of the War Department (1942. 6 vols.); and minutes of the Domestic Operating Subcommittee, the Domestic Supply Committee, and the Petroleum Supply Distribution Board. One of the larger series consists of daily, weekly, and monthly reports on pipe-line operations, with maps, blueprints, and summary sheets for each company.

FOREIGN PRODUCTION DIVISION

[947]

This Division, originally a part of the Foreign Division, was established as a separate unit in October 1943 to direct the foreign operations of the Administration. Its task was to ensure that the petroleum industry of Allied, neutral, and American concerns abroad produced the crude oil and condensates necessary to meet essential foreign refining and United States import requirements, through maximum utilization of existing production capacity and the development of necessary additional capacity. It obtained detailed information concerning the oil fields of foreign countries and the facilities available for the production and transportation of crude petroleum; cooperated with the Program Division in determining the quantities that needed to be produced in order to meet requirements; allocated global crude-oil requirements to producing regions and formulated operating programs; determined the need for additional facilities and personnel in exploration, development, production, and transportation in order to maintain and increase the output of foreign crude petroleum; established the need for critical materials in the foreign production program and passed on individual applications for such materials; and followed the results of foreign operations to determine conformity with the established production program, to stop departures from the program, and to make program revisions where necessary.

Records.—The records of the Division (223 feet) are in the National Archives. They consist of the Division's central files and a few smaller series separately maintained by some of the sections. The central files include records pertaining to world-wide petroleum development and production; to exploration, development, production, materials and equipment, transportation, consumption and marketing, and supply programs for specific foreign countries; and to the development of a petroleum program for Alaska. Among the sectional records are project files relating to production and transportation facilities for foreign refineries in areas that were under the jurisdiction of the Office of Economic Warfare or the Office of Lend-Lease Administration; tabulations of figures of the Foreign Operations Committee on foreign crude production, petroleum product sales by country and company, drilling operations, and the production of foreign refineries; statistical data collected for the use of the State Department in its discussions with the British in 1944 on the subject of a world oil agreement; and applications by foreign petroleum companies for priority assistance in obtaining food shipments.

FOREIGN REFINING DIVISION

[948]

This Division, created out of the former Foreign Division in October 1943, functioned to ensure that the foreign refining industry produced the petroleum products necessary to meet Allied military and essential civilian requirements (except those met from the United States) through the maximum utilization of existing refining capacity and the development of necessary additional capacity. The Division, in cooperation with the Army, the Navy, the State Department, the Foreign Economic Administration, the War Production Board, the Office of the British Petroleum Representative, representatives of the Soviet Government and other Allied Nations, and members and committees of the foreign petroleum industry, developed short- and long-range plans and programs.

It furnished the military agencies with maps and other data covering foreign refinery installations in enemy territory and worked with the Army and Navy on secret plans for the rehabilitation of facilities in areas occupied by Axis forces. In general, it performed the same functions with regard to the foreign refining program as the Refining Division performed with regard to the domestic program.

Records.—The records of the Division (169 feet) are in the National Archives. One series includes correspondence, memoranda, and reports on such subjects as foreign petroleum requirements and refinery operations, petroleum resources and policies in foreign countries, foreign oil missions, the rehabilitation and reconstruction of refineries in foreign countries, and petroleum supplies in liberated areas. Also present are minutes of committees dealing with foreign petroleum production and supply. Other series include records relating to foreign refinery projects approved by the Foreign Petroleum Requirements Committee and to the procurement of controlled and critical materials for foreign petroleum refineries; reports on the "Russian Program"; and bound volumes of technical data on various aspects of refinery operations prepared for the use of the Soviet Union.

FOREIGN SUPPLY AND DISTRIBUTION DIVISION

[1994]

This Division, one of the three divisions created in October 1943 out of sections of the old Foreign Division, had the job of ensuring that refinery products and crude oils available for export were supplied to fulfill the requirements of areas outside the United States and that the requirements of the United States from foreign areas were filled with maximum efficiency in the use of materials and the facilities of transportation and distribution. The Division collaborated with the Program Division in the formulation of long- and short-term foreign supply programs; directed the operations of the industry supply committees; kept the Petroleum Administration for War informed of the present and projected stock situations in foreign areas; followed the progress that was made and changed the programs when necessary to meet emergencies; assisted the foreign petroleum industry in obtaining from the United States such materials, equipment, and manpower as were needed to maintain and operate distribution facilities; and advised the proper governmental agencies of crude oil and refinery products that were available for export to the United States, Canada, and other countries from foreign sources. A special function of the Division was to maintain effective coordination between the United States and Canada in all petroleum activities of concern to both countries. The Canadian Liaison Officer in the Director's Office guided these activities and represented the Administration in discussions with the Canadian Oil Controller's Office. The Division worked in very close cooperation with the Foreign Operations Committee (an industry committee) in bringing together information concerning world-wide requirements, supply, and transportation.

Records.—The records of the Division (129 feet) are in the National Archives. They include minutes and other records of such committees as the European Petroleum Committee, the European Liberated Areas Committee, the Caribbean Area Petroleum Committee, the Bunker Control Committee of the Foreign Economic Administration, the British Oil Control Board, and supply and distribution committees for the different world areas and regions. The records also include reports on the Canadian petroleum program; statistical reports by various oil companies on their total sales in Latin America; legal studies of Middle East pipe lines and agreements with regard to refineries; papers on the Soviet protocols; data on lend-lease procurements, requisitions, requirements, and policy; and records pertaining to furnishing tankers to Great Britain. Among the records are many reports, maps, and charts prepared by the Enemy Oil Committee concerning such subjects as facilities in Axis-controlled countries, Axis military and civilian consumption of petroleum products, and industrial and civilian consumption of petroleum substitutes in Axis countries.

* * * * *

SOLID FUELS ADMINISTRATION FOR WAR

[1351]

An Executive order of April 19, 1943, established the Solid Fuels Administration for War within the Department of the Interior as successor to the Office of Solid Fuels Coordinator for War, which is described above. It was headed by the Secretary of the Interior as Administrator, and it was the Government's chief

instrument for the wartime control of the solid-fuel industries. It was responsible for the formulation of general policies and specific programs for the efficient development, conservation, and use during the war of solid fuels, that is, all forms of anthracite, bituminous, sub-bituminous, and lignitic coals, including packaged and processed fuels, and, after 1943, coke. It submitted to the War Production Board recommended programs for the distribution of solid fuels and it acted as the claimant agency for the solid-fuel industries under the War Production Board's Controlled Materials Plan. It recommended to the Office of Price Administration maximum prices for solid fuels. It advised the Office of Defense Transportation and the War Shipping Administration regarding facilities needed for the transportation of solid fuels, and the War Manpower Commission regarding the manpower needs of the solid-fuel industries.

The Solid Fuels Administrator had authority to issue and enforce policy and operating directives to the solid-fuel industries not in conflict with directives of the War Production Board and the War Manpower Commission; and under the direction of the War Production Board, he exercised allocation powers with respect to solid fuels. In May 1943 the Secretary of the Interior delegated to the Solid Fuels Administration for War his responsibility for the operation of coal mines that had been seized by the Government. On July 27, 1943, this responsibility was transferred to the Coal Mines Administration, which exercised the responsibility until September 15, 1944, when the Solid Fuels Administration for War resumed it. The Solid Fuels Administration for War took charge of the final liquidation of the Interior Department's Bituminous Coal Division in August 1943. It was itself abolished, effective June 30, 1947, by an Executive order of May 6, 1947.

The Solid Fuels Administration for War provided part of the United States representation on the Combined Coal Committee, which was established in 1943 by the Combined Production and Resources Board and the Combined Raw Materials Board to handle world-wide problems of coal production, allocation, and transportation.

Records.—The records of the Solid Fuels Administration for War and of its predecessor (1,100 feet) are in the National Archives. They consist of the central files, some separately maintained records of subordinate units of the headquarters organization, and some field-office records. The central files (350 feet) include general correspondence; reports from the divisions; copies of the rules, regulations, and orders of the Administration; minutes of most of the Administration's advisory committees; minutes, progress reports, and other records relating to the Combined Coal Committee; and the Administration's "Report of War Activities to June 30, 1944" (Dec. 1944. ca. 600 p. and appendixes, types) and "Report of War Activities, Revised to September 30, 1945" (n. d. ca. 695 p. and appendixes, typed). Personnel records are in the Office of the Chief Clerk, Office of the Secretary of the Interior.

See Jesse B. Massitte and Robert Wolfe, "The Solid Fuels Administration for War and Industry Advisory Groups," in *Dickinson Law Review*, 48: 141-154 (Mar. 1944).

OFFICE OF THE DEPUTY ADMINISTRATOR

[1352]

The Secretary of the Interior delegated his responsibility for directing the Solid Fuels Administration for War to the Deputy Administrator, who supervised the activities of the organization and served as chairman of the interagency Solid Fuels Requirements and Distribution Committee and of the Combined Coal Committee. Assistant Deputy Administrators handled functions relating to the production, allocation, and distribution of bituminous coal, anthracite, and coke; the coordination of transportation activities; and the general administration of the agency and its liaison with other agencies.

Records.—Most of the Deputy Administrator's records are in the agency's central files in the National Archives. Also in the National Archives but not part of the central files are correspondence, memoranda, reports, and other papers of the Deputy Administrator's Office relating to the circumstances that led to Government seizure of various mines, the consolidation of field offices of the Coal Mines Administration and the Solid Fuels Administration for War, and the liquidation of the Solid Fuels Administration.

SOLID FUELS REQUIREMENTS AND DISTRIBUTION COMMITTEE

[1353]

This Committee considered the problem of allocating available solid fuels among the claimant agencies represented on it. These claimants were the War

Production Board, the Combined Production and Resources Board, the War, Navy, and State Departments, the Office of Defense Transportation, the Office of Price Administration, the Maritime Commission, and other Federal agencies with regulatory powers over segments of the national economy having substantial requirements for solid fuels. Any agency dissatisfied with its allocation might appeal to the War Production Board.

Records.—Some minutes and other records relating to the Committee are in the National Archives among the records of the Legal Division of the Solid Fuels Administration for War.

SOLID FUELS ADVISORY WAR COUNCIL

[1354]

This Council was established on December 18, 1941, as the Industry Committee on Solid Fuels to consider questions of overall policy and specific programs proposed by the Office of Solid Fuels Coordinator for National Defense, particularly those affecting distribution. Its functions continued under the Solid Fuels Administration for War. Its 18 members represented producers, distributors, tidewater dock operators, Great Lakes operators, railroads and other transportation facilities, coke producers, mine labor, and the consuming public.

Records.—Copies of minutes and other papers relating to the Council are in the National Archives among the records of the Legal Division of the Solid Fuels Administration for War.

ADVISORY COMMITTEES

[1355]

Among other advisory committees to the Solid Fuels Administration for War were the National Advisory Coke Committee, established May 17, 1944; the National Anthracite Distribution Committee, established June 19, 1943; the National Advisory Committee on Local Distribution, established February 24, 1944; and the Tidewater Dock Coal Advisory Committee and the Lake Dock Coal Advisory Committee, both established January 12, 1944.

Records.—Copies of minutes of meetings of these committees are in the National Archives among the records of the Legal Division of the Solid Fuels Administration for War.

PRODUCTION, CONSERVATION, AND INFORMATION DIVISION

This Division conducted educational campaigns to further industry and consumer compliance with wartime solid-fuel measures. It disseminated information about the condition of solid-fuel supplies and the plans of the Solid Fuels Administration for War with respect to them. It secured the cooperation of Government agencies, the solid-fuel and allied industries, and the consuming public in a program of fuel conservation and dealt with the technical problems of production and labor relations.

Records.—In addition to the records of the Division that are in the Administration's central files, there are also in the National Archives a series of press releases of the Solid Fuels Administration for War and its predecessor, 1941-47 (5 feet), and some separately filed correspondence of the Division's chief.

OFFICE OF THE ASSISTANT DEPUTY ADMINISTRATOR, TRANSPORTATION

[1357]

This Office coordinated the activities of the Solid Fuels Administration for War with those of the Office of Defense Transportation, the War Shipping Board, the Interstate Commerce Commission, and the Association of American Railroads; it dealt with all matters connected with the supply of empty cars and the transportation of solid fuels; and it was represented on various interagency committees handling problems of transportation and stockpiling. The Office was abolished in 1945 and its functions were transferred to the Bituminous Distribution Division.

Records.—The records of the Office are in the central files of the agency in the National Archives.

BITUMINOUS DISTRIBUTION DIVISION

[1358]

This Division correlated the activities of regional and field bituminous offices, supervised and studied bituminous supplies and requirements, prepared and recommended plans for the allocation of bituminous coal in the United States and abroad, and after 1945 carried on the functions of the former Assistant Deputy Administrator in charge of transportation.

Records.—The records of the Division are in the National Archives. They include schedules of tariff rates of railroads and water carriers, applications and correspondence relating to export overseas of solid fuels, 1946-47, and copies of contracts for production and delivery of special-purpose coal.

ANTHRACITE DISTRIBUTION DIVISION

[1359]

This Division correlated the activities of the regional and field anthracite offices; supervised and studied anthracite supplies and requirements; and prepared plans for the allocation of anthracite in the United States and abroad.

Records.—Correspondence and other records of the Division are in the National Archives in the Administration's central files and in a small separate series.

COKE DISTRIBUTION DIVISION

[1360]

This Division correlated its activities with those of the War Production Board with regard to industrial coke and carried out the responsibilities delegated by the War Production Board to the Solid Fuels Administration for War regarding the equitable distribution of domestic coke. It recommended plans and programs to insure the greatest possible tonnage of coke for domestic use and devised methods of distribution to continue the delivery of coke to consumers who normally used it and to provide coke as an alternate fuel where it was most needed. The Division was abolished on May 21, 1945.

Records.—The separately maintained records of the Division (less than 1 foot), consisting of reports and correspondence relating to coke shipment, production, and requirements, are in the National Archives.

OFFICE OF THE ASSISTANT DEPUTY ADMINISTRATOR FOR PRICES AND FOR ADMINISTRATION

[1361]

This Office coordinated statistical and administrative services with other functions of the Administration; acted for the agency in making recommendations concerning prices, maintaining liaison for the purpose with the Office of Price Administration and the Director of Economic Stabilization; maintained liaison with the War Manpower Commission and the Selective Service System regarding manpower problems in the coal-mining industry; and carried out miscellaneous functions not assigned to other offices.

Records.—Tabulations of the Office showing accumulative shipments of coal as reported and some correspondence and memoranda relating to budget and administration (1 foot) are in the National Archives.

OFFICE OF THE GENERAL COUNSEL

[1362]

Through its Legal and Compliance Divisions, this Office drafted regulations and orders; prepared recommendations to the War Production Board, the Office of Defense Transportation, the Office of Price Administration, and other Federal or State agencies in furtherance of an adequate supply and distribution of solid fuels; prepared interpretations of regulations and orders, legal opinions, and reports on legislative matters; and, in collaboration with the Justice Department, took part in the litigation affecting the Solid Fuels Administration for War. It was responsible for obtaining the compliance of producers, distributors, retailers, and consumers with the regulations, orders, and directives of the Administration. In performing this function it operated mainly through the regional and field offices of the agency.

Records.—The following records of the Office are in the National Archives: Special-assignment reports by compliance agents; case files with correspondence and related papers concerning mine-operator applications for exemptions from rules and regulations of the Solid Fuels Administration for War, especially as to the number of days and hours worked at each mine; copies of procedural issuances and war regulations, with their revisions and amendments; litigation files; and copies of minutes of Administration advisory committees.

FIELD OFFICES

[1363]

The 42 regional offices of the Solid Fuels Administration for War, were divided into anthracite and bituminous production and distribution offices. An area distribution manager directed the activities of each of the bituminous offices, and a regional director directed each anthracite office. Compliance officers investigated

matters of compliance with rules and regulations; and field distribution representatives conducted surveys of coal on hand, made recommendations to area managers regarding measures for removing local coal shortages, and worked with local and regional advisory committees. All field offices were abolished on April 30, 1947.

Records.—Records of regional offices are in the National Archives, interfiled with field records of the Bituminous Coal Division and the Coal Mines Administration. For each office there are reports and memoranda concerning the district advisory boards, compliance, deferment of coal-mine workers from selective service, manpower stabilization in the area, and the shipment of coal under Army contracts; copies of contracts between coal producers and the Defense Supplies Corporation; monthly and annual production reports on the number of men and days worked at mines; and weekly reports from district offices to the national office on coal shipments and strikes in their areas.

REGIONAL ANTHRACITE DISTRIBUTION COMMITTEES

[1364]

Six regional anthracite distribution committees were established by the Solid Fuels Administration for War on June 19, 1943, to advise and make recommendations on the supply and flow of anthracite. Each committee was composed of two producers, one wholesaler, and two retail dealers.

Records.—Minutes of the meetings of these committees and correspondence relating to them are in the Administration's central files in the National Archives.

BITUMINOUS COAL PRODUCERS ADVISORY BOARDS

[1365]

The Solid Fuels Administration for War continued the coal producers boards established by the Bituminous Coal Act of 1937 (50 Stat. 76). These boards kept the agency informed of conditions in the producing districts, familiarized producers with the agency's rules and regulations, collected cost and realization data to assist the agency in determining the effect of established minimum prices, helped area distribution managers in selecting producers best able to ship the sizes and types of coal needed by particular consumers, and assisted in solving problems relating to over-all coal distribution for the entire industry.

Records.—Minutes, correspondence, and other papers relating to the producers boards are interfiled among the records of the Administration's Legal Division and its district offices in the National Archives.

AREA ADVISORY COMMITTEES ON LOCAL DISTRIBUTION

[1366]

On February 24, 1944, the Solid Fuels Administration for War established area advisory committees on local distribution to take over functions formerly performed for it by the Office of Defense Transportation's local advisory committees. Members of the 130-odd committees were appointed on the basis of recommendations submitted by retail-dealer groups. They coordinated retail-dealer activities in their communities, made inventory checks, recommended necessary modifications of the limitations placed by the agency upon local dealer deliveries, and advised as to the tonnages needed in a given community to meet minimum heating requirements. The area advisory committees appointed about 480 committees on emergency distribution to investigate serious shortages of coal in their communities and make recommendations for the shipment of coal to relieve the shortages. Local municipal officials and coal retailers usually served on these community committees.

Records.—Correspondence and reports relating to the committees are among the field records of the Solid Fuels Administration for War in the National Archives. Some minutes of the emergency distribution committee of New York City are in the agency's central files in the National Archives.

The CHAIRMAN. Secretary Fowler, I want to compliment you on a very, very fine statement. I think it lays the foundation here for the ongoing legislative discussion that we'll be having and I want to compliment you for giving us not only the historical background but relating it to the current situation.

I think it was a brilliant statement.

We're delighted to welcome Mr. Leonard Woodcock, who is president of the United Automobile, Aerospace and Agricultural Implement Workers of America.

As I indicated before, his interest has transcended the pure labor responsibilities. He has taken a tremendous interest in a wide spectrum of matters of public concern and we're delighted to welcome you today.

STATEMENT OF LEONARD WOODCOCK, PRESIDENT OF UNITED AUTOMOBILE, AEROSPACE AND AGRICULTURAL IMPLEMENT WORKERS OF AMERICA, UAW

Mr. WOODCOCK. Thank you very much, Mr. Chairman.

With your permission, I would just like to file my statement and just make brief excerpts from it.

Listening to Secretary Fowler, it's obvious that when this Nation decides to pull itself together, it can do a job that can be done no other place on this earth, and I do not share the concept that the finest days of this country are behind us.

We still have the capacity that we had in the 1940's and that we had in the early 1950's.

I'm delighted with the opportunity to respond to a very innovative piece of legislation, the National Energy Production Board Act of 1975, S. 740.

We recognize that a single piece of legislation cannot possibly encompass the enormous range of issues that need to be dealt with.

We recognize, too, the importance of a planned approach to energy decisionmaking. We note that effective planning requires a new role for the public sector with new public institutions, as well as significant improvement in democratizing these institutions.

We would suggest the possibility of the composition of the Board be on a broader basis than the bill now recognizes and that those who have served on the Board for 3 years after such service, we suggest should not represent any person engaged in the exploration, production, processing, transportation, distribution or marketing of coal, uranium, natural gas, crude oil, or petroleum products.

We are certainly fully in support of the NEPB drawing up and implementing an energy exploration program to provide a reliable, independent energy inventory. Such an inventory should go beyond that proposed, we believe, in section 202, and we believe there's no reason to restrict the efforts to oil and gas resources.

We agree that energy is a critical social resource and we see no reason why an energy inventory should be confined to the public domain and other Federal lands.

It is proposed that the NEPB has the right to contract with commercial sources for survey work and exploratory drilling.

We suggest that it is imperative that preference be given to public agencies and the contracts with commercial sources include some guarantee of the independence of those sources from energy production.

With regard to the development of the naval petroleum reserve in California and Wyoming, we believe we need a thorough cost-benefit analysis of alternative ways of creating a strategic oil reserve.

If the national consensus is as we think it is, that this country was caught short last year, in part because it did not have adequate strategic oil reserves or storage capacity and that we should now move to create it in the public sector.

The appropriate approach is to determine the lowest cost method of providing those reserves.

Given the evidence, at the moment, of excess supply in world oil markets, and of a weakening in the unanimity of OPEC members on the issues of production and marketing strategy, what might well be the leverage bargaining by a Government purchasing agency now being considered in other legislation before the Congress, could provide these strategic reserves at lower cost than section 301 contemplates.

While development of a plan to bring the reserves to a state of readiness is desirable, the Board should also determine whether viable cost alternatives are available.

We welcome the thorough supply/demand analysis for coal promised in section 402. At the same time, we urge that more public sector efforts be contemplated in the solar energy field and we'd like to see this designated as one of the programs to be conducted by the NEPB.

With regard to section 403 in the energy transportation systems, the UAW is committed to thoroughgoing nationalization of the Nation's railways, and therefore we regard section 403 as being somewhat limited in scope.

We have consistently supported the concept of a national fuels corporation, partly reflected in Senator Stevenson's bill proposing a Federal oil and gas corporation.

In our testimony before the Joint Economic Committee we argued extensively in support of continued Federal regulation of natural gas and urged expansion, not contraction, of regulatory authority.

In fact, there are strong arguments regarding all energy resources as public utilities to be subjected to Government regulation. In that same testimony, we suggested the Congress reopen the subject of Federal charters for major energy companies considered by this committee last year.

We would hope that NEPB legislation would include Federal chartering for private companies participating in NEPB programs.

We have some reservations, Mr. Chairman, about the National Energy Production Trust Fund as designated in title VI. Although the idea of a trust fund has appeal with regard to public energy development, there are some problems with such funds. They tend to create their own vested interest groups and can be too narrowly oriented, but we know that the trust fund here contemplated is limited in time.

We certainly believe that this bill represents an important effort to grapple with difficult and complicated issues in a bold and dramatic manner.

Thank you.

[The prepared statement of Mr. Woodcock follows:]

STATEMENT OF LEONARD WOODCOCK
PRESIDENT, UNITED AUTOMOBILE, AEROSPACE AND AGRICULTURAL
IMPLEMENT WORKERS OF AMERICA, UAW
BEFORE THE
U. S. SENATE COMMITTEE ON INTERIOR AND INSULAR AFFAIRS
ON THE
NATIONAL ENERGY PRODUCTION BOARD ACT OF 1975
(S. 740)

March 20, 1975

I would like to thank the Chairman and members of this Committee for the opportunity to respond to a very innovative piece of legislation, the National Energy Production Board Act of 1975 (S. 740). We in the UAW have been extremely gratified by Congress' willingness to seek out and to develop fresh answers to the very serious problems of energy supply and demand in our economy and we have been especially pleased that the UAW has had a number of opportunities to share in this effort.

Members of this Committee are undoubtedly aware of the UAW's National Energy Program, issued by our International Executive Board just one year and a month ago. We are pleased that much of the energy legislation developed by Congress since that time has reflected our program's recommendations, and the bill we are discussing today is certainly one of those. The UAW, of course, recognizes that a single piece of legislation cannot possibly encompass the enormous range of issues that need to be

dealt with but in the brief time available to me today I would like to highlight major areas in which the elements of the National Energy Production Board Act (NEPB) could be brought into greater harmony with the program and principles to which we remain committed.

In our National Energy Program and more recently in my testimony before the Joint Economic Committee of Congress last month, the UAW has stressed the importance of a planned approach to energy decision making. However, in making this commitment we recognize that effective planning requires a new role for the public sector with new public institutions, as well as significant improvement in democratizing these institutions. These considerations are not separable from one another.

Thus, while we welcome this legislation in principle, and see great potential for the NEPB to become the kind of planning agency we have called for, we would like to suggest some major revisions in, and additions to, the bill as it stands at the moment.

To begin at the beginning, it is obvious that the membership of a Board of this sort will have a critical influence on the sorts of policies submitted for Congressional approval or disapproval. In this regard Section 101, paragraphs (b) and (c) (2) which deal with the membership of the Board are not satisfactory. The description in paragraph (b) of what sort of persons would be suitable as Board members reflects an elitist bias

and gratuitously assumes that "training, experience and attainments (whatever they may be) in academia, industry, commerce, and/or government" necessarily qualify a person for carrying out the duties and responsibilities of a Board member. What about experience in community action, consumer affairs, the labor movement -- especially workers in energy industries, for example? Energy, ability and most important, commitment to the public interest, are just as likely to be found by looking outside our traditional sources of decision makers. Some new blood would be a definite asset to a new government agency.

Secondly, paragraph (c) (2) dealing with the conflict of interest issue is inadequate. Public confidence in government agencies is currently at a dangerously low ebb. This has not come about by accident. On the contrary, the American people have in recent years been witness to corruption and abuse of public confidence so profound and so widespread as to be almost without precedent in our history. Energy is both central to our national well-being and has been the scene of some of the worst corruption and abuse of the public interest. Therefore, it is absolutely crucial that any new public institution dealing with energy -- especially one potentially so powerful and important as the NEPB -- be utterly free of any taint or suspicion. Although paragraph (c) (2) would prohibit a number of potential abuses it is still not strong enough to guarantee

the degree of purity necessary to build public confidence. Given the growth of interlocking directorates and covert collusion they make possible, stronger and more explicit conflict-of-interest clauses are required.

As a minimum, we would suggest the following revisions to paragraph (c) (2):

1. Reverse the order in sub-paragraph (1) to provide:

"hold any other position in the executive branch or engage in any other employment during the period of his appointment."

This avoids the possible ambiguity that the executive branch modifies employment and position.

2. Add the following to sub-paragraph (3):

"...for three years after his service on the Board has ended, represent any person engaged in the exploration, production, processing, transportation, distribution or marketing of coal, uranium, natural gas, crude oil or petroleum products."

This is to avoid the common situation where a regulated entity, while the chairman or board member is working for the agency, makes job overtures.

3. Add a paragraph (5) to read as follows:

"(5) The above provisions are intended to supplement and not in any way to reduce the duties of the Chairman and Board Members to avoid conflicts of interest under other statutes or under the common law."

This is perhaps the most critical change, because there are a number of common law duties and duties under other statutes to avoid

conflicts of interest. It could be construed that specifying sub-paragraphs (1) through (4) means that a person has no other duty to avoid conflicts of interest. Paragraph 5 would make it clear that the common law duties as well as duties under other statutes would still exist.

On the question of the relationship between democratic control and the structure of decision-making institutions, we are pleased to see that Section 503, Review and Comment, does provide the requirement that nongovernment groups look over the programs developed by the Board prior to submission to Congress. This principle would make a healthy contribution toward the Board's openness and public responsiveness. However, the minimum period mandated for reaction by such groups should be longer than 30 days, and there should be adequate provision for them to obtain background information.

On the other hand the proposal for Advisory Committees in Section 701 while attractive in principle, makes it too easy for private energy interests to dominate by failing to specify the proportions in which interested parties shall be represented on the committees.

I shall now turn to a discussion of the specific programs proposed for the Board.

We are certainly fully in support of the NEPB drawing up and implementing an energy exploration program to provide a reliable independent energy inventory. However, such an inventory should go far beyond that proposed in Section 202. First, there is no reason to restrict the effort to oil and gas resources. Second, as long as we agree that energy is "a critical social resource," we see no reason why an energy inventory should be confined to the "public domain and other federal lands." A major obstacle to dealing successfully with our energy problems is our woeful ignorance of resources in the private domain. This lack has seriously interfered with the FEA's allocation program and with the operations of federal regulatory agencies such as the Federal Power Commission (where, for example, accurate information on proved reserves is essential for determining appropriate prices for interstate natural gas sales). Furthermore, one of the purposes

of the energy inventory is to form a basis for an energy development plan and it is not clear how such a plan could be formulated without knowing the distribution, geophysical and chemical characteristics, etc., of resources in both the public and private domain.

Next, objections must be raised to Section 202 (b) (1) and (2) which would permit the NEPB to contract with "commercial sources" for survey work and exploratory drilling. Under this provision the NEPB could happily shift the major part of the exploration program over to the major energy corporations, thereby negating the two critical goals of independent information and expanded direct public sector activity. In view of the many serious questions that have been raised about the private sector's reserve reporting methods and the obvious advantages of cornering the information market, it is imperative that preference be given to public agencies and that contracts with commercial sources include some guarantee of the independence of those sources from energy production.

Since accurate independent information is so crucial to the effectiveness of the program and to democratic control of decision making, some form of public review of the quality of service rendered by such private contractors is also needed.

I would now like to discuss the bill's provisions dealing with expanded energy production.

The first section of the bill dealing with this is Title III, Section 301 concerning development of the Naval Petroleum Reserves in California and Wyoming. According to the language of the bill, the intent of the Naval Reserves Development and Production Program is to provide reserves "to meet emergency needs of national security for strategic oil storage and critical civilian requirements." While we are in wholehearted agreement with these goals, the Naval Reserves Development and Production Program is not necessarily the best way to meet them. Indeed, this section of the bill illustrates almost classic cart-before-the-horse thinking: a program of major investment in plant and equipment of almost unprecedented scale is to be drawn up, and then the costs and financing arrangements are to be worked out. The whole project is to be presented to Congress for review within 90 days of the effective date of this section, and will be implemented if Congress fails to disapprove within 60 days.

Rather than dropping some very costly eggs into this particular basket, we really need a thorough cost/benefit analysis of alternative ways of creating a strategic oil reserve. Surely, if the national consensus is (as we think it is) that this country was caught short last year in part because it did not have adequate strategic oil reserves or storage capacity, and that we should now move to create it in the public sector, the appropriate approach is to determine the lowest cost method of providing

those reserves. Given the evidence at the moment of excess supply in world oil markets, and of a weakening in the unanimity of OPEC members on the issues of production and marketing strategy, it might well be that clever bargaining by a government purchasing agency (now being considered in other legislation before Congress) could provide these strategic reserves at much lower cost than the Section 301 scheme. While development of a plan to bring the reserves to a state of readiness is desirable, the Board should also determine whether viable lower cost alternatives are available.

The remaining production programs are outlined in Title IV -- Programs Requiring Express Legislative Authorization. We certainly welcome the thorough supply/demand analysis for coal promised in Section 402.

When we put forward the idea of a National Energy Production Board in testimony before the Joint Economic Committee last month, we suggested coal development as a priority program for such a Board. At the same time we urged more public sector efforts in the solar energy field and we would certainly like to see this designated as one of the programs to be conducted by the NEPB.

With respect to Section 403 dealing with Energy Transportation Systems, this Committee is probably well aware that the UAW is committed to thoroughgoing nationalization of the nation's railways and therefore we regard this section as much too limited. The patent failure of private railroad interests is so apparent that we question the need for further costly and voluminous reports to establish the urgency of the need for public action. Moreover, the provisions of this section are so hesitant and tentative, the language so loose and open-ended, that under them it would be perfectly possible for the public treasury to assume all the costs of physical rehabilitation of major transportation networks and not get even a share of the equity it creates. Rather than implement this program, it would almost make more sense to allow the railroad corporations to go bankrupt one by one and have the public treasury buy them up cheap, as would any competent businessman.

Section 404 of the Federal Oil and Gas Production Program shares many of the weaknesses of Section 403. While we welcome this as a first attempt to sketch out what amounts to investment and production planning, there are serious dangers in legislating a sketchy plan. The major weakness of this section is that too much is left unsaid, but it must also be faulted for many of its explicit provisions.

In particular, paragraphs b (4) and (7) are especially objectionable. The first allows the federal government to share in the cost and to provide other incentives to maximize the participation of private enterprise in the development of oil and gas resources on public land. The assumption implied by this provision is that present incentives (and the principal incentive for the private sector, let us remember, is profits) are inadequate. The time is long overdue for this specious argument, pervasive as it is, to be laid to rest. First of all, we must recognize that our energy supply problems have not arisen from restrictions on the private sector's share of energy production nor from weak profits in energy industries. Therefore there is no reason to seek to maximize the private sector's role. Nor is there any reason for the public purse to finance this sort of private energy investment. If we truly want to free our economy from the grip of multinational conglomerate energy giants, the balance must be redressed by maximizing direct public sector activity. That is why we have consistently supported the concept of a National Fuels Corporation, partly reflected in Senator Stevenson's bill proposing a Federal Oil and Gas Corporation.

If, however, this Committee prefers not to deal with direct productive activity by the public sector and instead regards the NEPB primarily as an "indicative planning" agency, a lot more work needs to be done in establishing explicit guidelines and planning practices for this agency.

The requirement, in paragraph (b) (7), for an estimate of the current market value of the fuels to be produced seems to imply that "market price" must be used for any sales of such fuel. However, market price is currently affected by the monopoly power of the private producers. Therefore, paragraph (b) (7) should require an estimated value based on the cost of production in order to provide a standard against which that market price can be evaluated.

If the United States is going to have the kind of serious public effort in energy planning and production which the UAW and others have advocated on numerous occasions, we need to have much greater specification of the objectives of such a program. Quite frankly, "maximization" of production, regardless of cost, as this bill is committed to, is just too crude and inappropriate to long-range energy management. Secondly, we also need specific regulations governing joint public-private ventures or contracts, cost-evaluation formulae to avoid cost-overrun scandals, appropriate rate of return specifications for pricing policy, and so on. Nowhere does this bill address these major planning issues.

The other major, and indeed critically important, omission in this bill is provision for curbing the anti-social abuse of monopoly power.

Since a major part of this legislation is essentially concerned with a type of planning and the rapid implementation of a planned program, it is not surprising to find that more space is devoted to coordinating the efforts of

separate enterprises than to curbing abuse of such concentrated economic power. Nonetheless, such potential abuse must be anticipated and forestalled if the citizens of this nation are to retain their faith in legislators as protectors of the public interest.

These issues are grave and far-reaching and I must urge this Committee not only to make good the omission of such provisions but also to reconsider the implications of Section 304, Expediting Government Action, in this light.

We are all aware that there is a campaign underway to modify the operations of a number of regulatory agencies. Indeed one frequently hears that "regulatory lag" is a major constraint on expanding energy supply. Section 304 appears to reflect this opinion in providing a method for bypassing our present regulatory procedures. Time does not permit a full discussion of this issue, worthy as it is, but I would suggest that before forging ahead with a loosely worded, ill-defined section such as this one, more thorough analysis of the causes of "regulatory lag" is needed. For example, more might be accomplished by putting strict limitations on utilities' expenditures on rate case hearing exhibits, or even on the number of words in the submission, than by sacrificing public surveillance of publicly guaranteed monopolies.

In our testimony before the Joint Economic Committee we argued extensively in support of continued federal regulation of natural gas and urged expansion, not contraction, of regulatory authority. In fact there are strong arguments for regarding all energy resources as public utilities to be subject to government regulation. In that same testimony we suggested that Congress reopen the subject of federal charters for major energy companies considered by this very Committee last year. Rather than create new loopholes that lessen the public accountability of corporations, we would hope that NEPB legislation would include federal chartering for private companies participating in NEPB programs.

If we are going to move into an era in which public authorities will be planning production and distribution but most of the actual operations will be carried out by the private sector, we also urgently need some public discussion and ultimately legislation on the entire range of questions associated with choice of technology (labor versus capital- or energy-intensive techniques), costing methods, rates of return and pricing methods, and the role of the public sector as a monitor of the private sector. In the absence of any attempt to deal with these issues in this legislation the programs and procedures discussed here, if enacted into law, would permit enormously strengthened corporations to continue to make economic decisions in the same inequitable and undemocratic ways they have up to now, but without the threat of anti-trust prosecution and without review of their operations by regulatory agencies.

At this point I think it is evident that a great deal of work remains to be done to remodel this bill into a piece of legislation that will fully serve the objective of removing energy supply bottlenecks without sacrificing the public interest. This is one of the reasons that we have reservations about the National Energy Production Trust Fund as designated in Title VI of this bill. Although the idea of a trust fund has some appeal for public energy development, there are potential problems with such funds. They tend to create their own vested interest groups, and can be too narrowly oriented. For example, this title confines the use of the fund to the implementation of this particular act.

In closing, let me repeat that this bill represents an important effort to grapple with difficult and complicated issues in a bold and dramatic manner. It has considerable potential for filling many of the needs identified in the UAW's National Energy Program, but requires substantial revision to do so. As we in this nation begin to enter new and, for us, largely uncharted waters, it is more important than ever that we know the stars that guide us and that we choose those constellations that respond to the needs and hopes of the masses of ordinary Americans. This is the spirit in which we offer our suggestions for national energy policy; we hope this Committee will be guided by it.

The CHAIRMAN. Thank you, Mr. Woodcock, for an excellent statement. I think you've pointed to a number of areas where we have, frankly, presented a barebones bill, and the whole purpose of our effort here is to elicit the kind of comments and suggestions and amendments that you have proposed.

Our third witness, Mr. Robert Nathan, is head of Robert Nathan Associates, a distinguished economist and who also served as a top economist in the War Production Board in World War II.

We're delighted to welcome you to the committee.

STATEMENT OF ROBERT NATHAN, OF ROBERT NATHAN ASSOCIATES, INC.

Mr. NATHAN. Thank you very much, Mr. Chairman.

I would like to just briefly focus on the interrelations of this organizational recommendation and the policy issues as I see them emerging in this urgent situation.

I think Secretary Fowler gave an excellent description of the War Production Board and some of its problems and successes. I was there, too, and served as head of the Planning Committee of the War Production Board and later as Deputy Director of the Office of War Mobilization.

Let me just bring to the attention of this committee two experiences in the War Production Board, which I think will focus particularly on this subject.

When we went into mobilization for defense in 1940 through the National Defense Advisory Commission, there was limited authority, but there was a lot of concern.

One of the problems that this country faced then was the problem we face now, namely, inadequate supply for an all-out mobilization effort.

I recall the tremendous struggle that took place in 1940, about steel capacity, about aluminum capacity, and about machine-tool capacity. These industries, understandably, and I'm not saying this critically, were just coming through a decade of underutilization of resources and very, very much concerned about the war coming and going and that they'd be left with tremendous excess capacity if we went back to a recession or a depression, and they, therefore, didn't want to go out and build 10 or 20 million tons of more steel capacity and hundreds of millions of pounds of aluminum capacity.

It was a tremendous struggle and had there not been this agency, even though it didn't have the authority that evolved later in the successive agencies, we would have never had that expansion of steel capacity, starting in 1940 when we had the room to expand in 1940 and 1941 in aluminum, and steel, and in machine tools, and the like.

Second, at the end of 1941, the Office of Production Management had come into being I think that was the third agency, the first one was the Defensive Advisory Commission. The second was SPAB—Supplies, Priorities, and Allocation Board, and the third, the Office of Production Management. We lacked any real central perspective as to what the needs were and what our resources were. As a result of the imaginative leadership of President Roosevelt, there came out at the end of 1941, goals and programs that shocked the Nation, and

which some thought were silly, namely 50,000 airplanes in 1942; and 125,000 in 1943 and the like. That would have never have happened if there had been no organizational responsibility and structure to focus on these problems.

That, I think, is the real genius of this whole program, because I don't care how concerned this country is about energy policies, or how urgent the problems are, if we don't have some kind of organizational structure that is both geared to the urgency of the problem and structured to do something about it, I don't think we're going to move.

In the 17½ months since the embargo, we've seen very, very little results. I think unless there is some focus of responsibility and authority, we're not going to get results.

As I see the problem, what we have here is something that might almost be called the four "P's". We have policies; we have plans; we have programing; and we have prosecution or implementation.

And, we've got to put together these goals and establish the appropriate policies and plans and programs that are really going to mesh this effort into something meaningful. There are some problems, however. For instance, I think Leonard Woodcock raised one and that is about the inventory of public resources. I agree with him 100 percent. Unless we have some total resource magnitudes and perspectives: what there is, what is likely to be available, what the prospects are, in the aggregate sense I think it's going to be very difficult to come out with any kind of a real program.

One of the functions that I believe this Board should serve in major degree is getting rid of all of this uncertainty. Not all of it, but I mean getting rid of the degree of uncertainty we have today about what our resources are: whether people are holding up production, whether they're pushing production, whether the big companies are swallowing the little ones, or the little ones are chewing away at the big ones; and whether the data really reveal what's going on, or whether they're doctored, or whatever it is. I do believe, Mr. Chairman, that if we can begin to get down to where we understand some of the real issues and some of the real facts in the energy area, we'd be part of the way home.

Let me just proceed with one of the areas that I think is a big problem for this proposed organization, and I hope it will be thought through very carefully. That is, what is the scope or extent of its functions in terms of policy coordination, or policy formulation or policy implementation?

We are in an urgent situation, there's no doubt. Maybe we won't have another embargo, or there may be one 6 months from now. The London Economist may be right in saying there's a glut of oil. Maybe there will be a glut but I think it's only temporary and I think we're in for a long string of severely challenging energy problems. The resources are going to be finite and we're using up in a limited time what took billions of years to create in fossil fuels.

Now, the problem, however, is that we have a government and that is where we should go when we have problems. Joe Fowler listed a good many of the agencies that deal with a good many of these energy problems.

It's very difficult to know how to coordinate these policies. The Federal Power Commission is an independent agency. The Fed-

eral Power Commission deals with prices. The Federal Power Commission deals with problems such as LNG. Should it or should it not approve a liquified natural gas project, or a synthetic natural gas project?

The whole problem of pricing—the prices that the pipelines pay, the curtailment orders on that natural gas, all are placed on the doorstep of the FPC, an independent agency.

Now, to what extent does one try to coordinate? I have to bring that in and I think from a policy point of view, it has to be part of the picture or we are just going to be lost.

And there are various other agencies. You have the Interstate Commerce Commission and the Department of Transportation dealing with all of these problems of transports. We are not, today, despite the challenge we all recognize, doing very much, if anything, about coal transport capability. And, unless we do something about coal transport capabilities, as well as coal production capabilities, we're going to be in very real trouble. So, I don't think it can be left to the ICC and I'm not sure it's at all appropriate to look to the ICC for a national mobilization effort in terms of energy.

The same thing is true of a lot of other areas. For instance, you take in the whole subject of transportation of petroleum. We have no capacity within this country's borders or along its seashores to handle the real deep water port requirements. We can't handle the big tankers. And, the big question is what do you do? Do you build offshore islands or do you have pipelines going from some kind of a buoy out at sea to bring it to land, or does the oil come from nearby countries and become transhipped to the United States? What are the environmental problems of this?

The Corps of Engineers is concerned with it, the Maritime Commission is concerned with it. We have all kinds of incentives in terms of building tankers, and these are very real problems.

And, unless there's somewhere, some place where these kinds of issues can be pulled together, we're going to get nowhere.

We have problems such as incentives right now. We're very much concerned in the oil and gas field about how we are going to optimize the production of oil and gas.

Mr. Chairman and members of the committee, we don't even think very much today about how fast we ought to bring these resources out and exploit them, or maybe we ought to be moving in some other direction and spread out some of these resources that are so desirable.

The question of incentives comes up and, sure, the Senate today is concerned on the floor, and has been, with the whole problem of tax incentives.

There was a hearing this week on whether gas should be decontrolled. Well, is that the way we're going to get the most gas? Is that the most efficient way? Should we go in for a windfall tax, or should we eliminate entirely the depletion allowance? Or if the gas is too low relative to oil, should we go for an excise tax in this area?

These are problems that have to be tied in with the energy problem, and all I'm trying to focus on is the fact that there are some very tough issues here which are not going to be solved unless something like this Production Board comes in and has a real coordinating effort.

In the coal area, I'm convinced that unless you have something like this, there is literally no agency in this government that's going to move on it.

Yes, you have the Department of Interior. You have the Bureau of Mines. You have the Office of Coal Research, but there's nowhere that's going to focus on what to do. We need to get from 600 million tons of coal to 1 or 2 billion in a few years.

We have the coal, but how are we going to get it out? What kind of incentives or inducements may be needed to increase coal mining equipment, coal carrying cars?

Even with the strip mining issue, this becomes very complicated as to who pays for what. Should everything be left to the marketplace?

Sure, you can require the reestablishment of the contours of the land after strip mining but the question, of course, is who pays for them and what are the inflation consequences, the equity consequences, and the incentive consequences.

We have problems of bottlenecks. I think that with the economy today running at over \$200 billion below potential at current prices—just take the government figures—these aren't my estimates—on potential GNP at 4 percent unemployment and then you take the actual estimates for the first quarter and you take that gap and you convert it to current prices. The GNP today is running \$210 billion, roughly, below potential at an annual rate.

Here we are literally doing nothing about overcoming some of these problems of energy at a time when we have 8 or 9 percent of the labor force unemployed, and more in prospect—a \$200 billion gap in production, and nothing being done. Just waiting, and maybe in a year or two, we'll do something about the oil price, or maybe a year or two from now we'll do something about coal cars. Maybe a year or two from now, we'll do something about building equipment to step up the availability of supplies so bottlenecks won't arise when the economy begins to move up.

Maybe we'll do something about large tankers, but the big point is that we have to have some kind of a central focus. The same thing is true with mass transit, and its interrelation to energy, all the complicated conservation problems, the whole problem of research and development of solar energy, geothermal energy, coal expansion, the gasification of coal. We have a whole slew of policy issues and unless there is somewhere where there is really policy coordination focusing on these issues, how its all put together, we're not going to get very far.

This doesn't mean that the Government has to do it. And I think Secretary Fowler was absolutely right, this doesn't mean nationalization. It doesn't mean Government ownership. It doesn't mean Government operation, nor does it mean that this board does all the operations. If it ever did, it would really be huge.

The problem is one of coordination, of planning, of programing and focusing. In a large measure, it's calling attention to, and clarifying the issues. I think this kind of organization can do a great job by putting central focus on our urgent problem.

And, Mr. Chairman, I must commend you for having brought this forward because I think it's the only way we're going to move toward a meaningful solution in our energy crisis.

[The prepared statement of Mr. Nathan follows:]

STATEMENT OF ROBERT R. NATHAN, OF ROBERT NATHAN ASSOCIATES, INC.

Mr. Chairman and members of the Committee, I appreciate the opportunity to testify on the proposed National Energy Production Board. Unless and until the resources of the Federal government are pulled together into a meaningful and effective organization, the prospects for fulfilling the ambitious goals of Project Independence will be dim indeed.

My experience in government services included several assignments with the agencies involved in mobilizing our material and human capabilities for defense and war in the early 40's. My first responsibility related to the determination of military requirements. Later I was Chairman of the Planning Committee of the War Production Board. Toward the end of the war I served as Deputy Director of the Office of War Mobilization and Reconversion.

In our free enterprise system, it is appropriate that we rely as fully as feasible on the private sector and on the forces in the marketplace to stimulate the maximum performance of private corporations and other private institutions.

However, the role of government is a critical one, when patterns of performance and basic values and resource uses must differ significantly from normal or traditional patterns. In wartime, it is clear that the government must assert leadership and must substitute over-riding national priorities for those values which in times of less stress assert themselves in the marketplace.

In the present energy situation, we are faced with problems of magnitude and timing not entirely dissimilar from those in wartime. Fortunately, our national security is not immediately at stake and we will have some time to make the huge adjustments that are clearly necessary. But progress is not going to come without a sharply focused set of objectives, a determined program for implementation, and above all responsible and responsive organizational arrangements. One of the great advantages that will come from the establishment of the National Energy Production Board is the responsibility to formulate programs that will pull together in one place the policy issues and operations problems that now are widely scattered and disparate among innumerable executive branches and regulatory agencies. The authority and responsibilities of the Federal Power Commission, the Interstate Commerce Commission, the Department of the Interior, the Department of Transportation, the Department of the Treasury, the Department of State, environmental authorities, and innumerable other agencies need to be subjected to scrutiny and study. Without some central effort there will not be a common set of policies nor coordinated implementation, which will fulfill the objectives of Project Independence.

The Bill properly does not give to the National Energy Production Board operating responsibilities in all aspects of mobilization of energy resources. Rather, I think it properly gives the NERB power to monitor activities and responsibilities, to prepare programs and directives, to prepare action programs, and to evaluate impacts of programs. What in essence is proposed is to have some kind of a central planning and coordinating role which can give to the President and the Congress the benefits of a total perspective on our energy problems and needs, and can provide the conceptual basis for realistic and ambitious programs, as well as successful implementation.

I commend the Chairman and the members of the Committee for offering this legislation, and I am confident that in the process of further developing and refining the Act, the needs of the nation in moving toward increased self-reliance in the energy field will be greatly enhanced.

The CHAIRMAN. Thank you Mr. Nathan for summing up a situation that we face, both from the standpoint of Government organization, and the standpoint of the economy. The need to marshal all our resources I think is extremely helpful.

Let me just say briefly what I feel the critical situation to be. The United States is fortunate in that we do have the human resources, well trained and adapted to do whatever we need to do. I think Mr. Woodcock brought that up, that we need to do whatever we need to do.

We have these tremendous resources that no other nation possesses. We have, too, the material resources of energy, both the finite: Coal, gas, oil, and so on, and the infinite, which is offered in solar energy, fusion, and hydroenergy.

I think the problem that we face is how do we marshal these resources, the infinite resources, solar energy as part of this massive effort.

Mr. Woodcock, I might say that in that area we passed legislation that established the Energy Research and Development Administration, headed by Dr. Seamans, a brilliant man.

I think Senator Glenn can verify that.

Frankly, they're underfunded and we're going to increase the programs of solar energy in various areas when there needs to be an ongoing effort.

The real question, as I see it, as it relates to our financial institutions, and the institutions of industrialized nations, is how do we get the oil and the coal out in the shortest time possible.

We can't do it on the basis of business as usual. Secretary Fowler would be the first to agree that we're trying to do the job to the point that the defense effort and the war effort, if we just allowed it to be handled in the marketplace, as the expression goes, we'd be nowhere.

I think the emergency is as great now as it was in wartime because of the threat on jobs, and to the financial integrity of the Western institutions we cherish.

The question is how do you do this in the shortest time possible. Time is of the essence. That is why we came forth with this kind of a National Energy Production Board. It seems to me that the opportunity is here to create new confidence.

I think during the World War II period, the net result of it, instead of one aluminum company, we came out with several. Did we not?

Secretary FOWLER. Four.

The CHAIRMAN. We created various other new companies as the result. Those that talk socialization and going to nationalize everything, the fear mongers, really do not have the vision as I see it. They can't dream the big things that we can do, and the things we need to do.

As I see it, we need to create new companies. If you turn this job over to the existing companies, there's only one company that can go out on the Outer Continental Shelf alone on a large operation and that's Exxon, the largest corporation. They even surpass General Motors as the result of massive increase in earnings.

What I ask, is how do we do the job of providing the managerial know-how to get at this oil? We don't know how much is out there. That's our first problem, and I think the Government should do the preliminary exploratory work. Find out from preliminary drilling what we have in the Outer Continental Shelf.

The total reserve we carry is 35 billion barrels, and those figures are put out by the American Petroleum Institute. Petroleum Reserve No. 4, adjacent to Bruno Bay, Alaska could conceivably carry as much as 100 billion barrels.

When we consider the Outer Continental Shelf, we forget the fact that 57 percent of it is in Alaska. That's over half of the OCS in one State.

If we are going to develop these resources in the shortest possible time, then I think this Board bringing into being all managerial entities and utilizing the private sector could create some new companies. Get the independents involved with the Government on a consortium or a joint venture basis.

In proper areas, where the Government itself with private contractors drilling in areas that offer great promise and in which we can move in the shortest time possible.

I just wanted to observe that I am in wholehearted agreement with one fundamental concept, this should not be a large board. We don't want to make it into the Pentagon. And, it ought to be a board in which you have a relatively small staff to the size of the task and let it work out on contract.

I might ask you, Mr. Woodcock, do you see from a job standpoint that opportunity here to put a lot of people to work on wealth producing jobs, compared to what we're now doing?

Mr. WOODCOCK. I think that goes without question. The capital equipment needed would, in itself, produce very substantial numbers of jobs.

The CHAIRMAN. In World War II the automobile companies were turning out tanks and other necessities for the war effort. They converted pretty fast, didn't they?

Mr. WOODCOCK. They converted pretty fast, but may I say they went kicking and screaming to the task.

The CHAIRMAN. They were reluctant.

Mr. WOODCOCK. It was many weeks after Pearl Harbor when they were still saying, we need to keep on making automobiles; but when the automobile production was stopped, how quickly they went to the task of doing the other job.

The CHAIRMAN. Well, certainly the auto companies could build a lot of these platforms that run into \$50 or \$100 million these days, a big platform on the Outer Continental Shelf.

One of the tasks that we envision here is the building of our railroad beds. I notice that Business Week came out for nationalization of railroad beds.

There's no way in which the private companies can advertise and pay out the costs for rebuilding the railroad beds.

As I see it, we can't move our coal if we're doing such crazy things. We're building wonderful new Amtrak trains and then we put them on a railroad bed and they shake the train to pieces, as well as the passengers.

Would any of you gentlemen like to comment on that?

Mr. WOODCOCK. Before Senate budget we made the observation on manpower programs, emergency manpower programs. It moves very slowly, and we think that should be pushed but we also advocate the revival of the public employment program federally administered.

We suggest that one very constructive way that that could be implemented would be the reconstruction of the railroad beds of this country.

The CHAIRMAN. That would reach into our industrial areas where you have the heavy unemployment.

Mr. WOODCOCK. Exactly.

The CHAIRMAN. And, all the railroad beds, I'm told and I've met with railroad unions, especially in the East—and it's happening out West, are in desperate state of affairs, as I understand it. Is that fair? Is that your judgment?

Mr. WOODCOCK. That's my understanding and this is a question of national security—the state of the railroad industry in this country.

The CHAIRMAN. It would seem to me that thousands could be put to work rebuilding those railroad beds. They must be rebuilt and that

is one of the objectives here in our energy policy, because as Mr. Nathan pointed out, what good is it if you have the coal if you can't move it. You can't even move it to the large markets where the utilities are located.

I'll defer now to Senator Johnston for questions. I'll have some more, but I want to compliment the panel. I think this has been an excellent presentation. I think you've zeroed in on the problem and task that's before us.

The note of optimism that you provided in bringing together in one place the key elements of a national energy policy in terms of providing the production. May I finally say that I think, and I must ask you this question, what impact do you feel a national mobilization effort, and I mean an all-out effort in which we'd move on the Outer Continental Shelf and Alaska to get that oil and gas in the shortest time possible, to move the coal, what impact will this have on the attitude of the oil cartel in terms of price?

Is it necessary that you actually start producing oil, which may be 4 or 5 years away; but what will be the impact of this national mobilization effort. It's visible. Not what we're talking about now, but actually visible?

Mr. NATHAN. That's right. I think if anything, it would tend to reduce the prices of OPEC, but I think even that price—let's assume they look way, way off in the distance, and I'm not sure they can or will—they certainly would not increase it further.

One of the things that bothers me now is the talk about indexing or escalator clauses on oil to the value of the dollar or to our own price index, which means further increases.

I think the important thing is, if we do get this exploitation of our resources, we and they together might be able to look ahead over the next half century to the whole question of alternative energy resources.

For instance, like Venezuela, today, is just riding along with the very high prices and doing a terrific job in terms of getting benefits for the country. It's building up its resources, but they're worried about 15 or 20 years from now.

I think if we did what you're suggesting in this board, Mr. Chairman, and not just proving up our reserves, determining what we have and making it available, but also moving in the other areas of alternative fuels over time, then I think we can bring this price problem within management.

The CHAIRMAN. May I say that our alternative resources program is a massive effort. It's about \$20 billion but that's going to be inadequate in a 10-year period. We have charged the Administrator of the Energy Research and Development Administration with full authority to go all out, in the shortest time possible—similar to our Apollo moon project program—and that authority is established now.

The administration did not ask for enough money for solar energy, for the oil shale program, and we intend to meet that issue.

Senator Johnston, I believe you have some questions you would like to ask at this time.

Senator JOHNSTON. Yes, thank you, Mr. Chairman.

Gentlemen, I want to join the chairman in congratulating you. It's been excellent and interesting. The only thing that's curious to me is that what you have said which, in my judgment, jives in no way with this bill.

I was just amused here, I mean it's like Alice in Wonderland. I listen to Secretary Fowler and agreed with almost everything you say, except this bill is going to do what you say. And, what did you say.

You said we've got to set priorities and we need to focus national attention, get rid of bottlenecks, provide incentives, mobilize the country.

Now, what does this bill do? This bill, when you boil it down, gives the Federal Government authority to review and monitor bottlenecks, review and monitor Federal agencies that deal with all these regulations and provide these bottlenecks.

But, then as far as the guts are concerned, it also authorizes the Federal Government to carry out a Federal oil and gas exploration program and to develop Federal oil and gas through Federal programs on Pet I, Pet II, Pet III, and Pet IV.

That's about all it does. It authorizes review for expediting governmental actions and evaluates proposed regulations.

It doesn't provide for the kind of centralized authority that you were talking about, Secretary Fowler. Those were the guts of the War Production Board, weren't they? The ability to give incentives where necessary and to expedite action? Is there anything here that expedites action?

Secretary FOWLER. I did not comment in detail on the bill, but I think you've made a valid point. As I compare the language and tone of the bill as it has to do with, let's say, the private sector; put to one side the question of the public—the Government owned reserves, but as it has to do with mobilizing and putting to work the private sector in this field, it seems to me that the bill does need, and this board does need to have the authority to direct, control, and coordinate, which was the specific language extracted in the Executive order setting up the Defense Mobilization.

The key words in that Executive order were "direct, control and coordinate." The keyword was "direct."

Secretary FOWLER. The reason it worked was that President Truman had delegated to the Director the authority to take action, not to make proposals and that sort of thing. That we took for granted.

Senator JOHNSTON. And, you set out so eloquently here about all the different windows you have to go to for permits that slows the process down. The Alaska pipeline is a prime example.

But there's not a word in here that would authorize anything other than making evaluations and proposals.

Secretary FOWLER. I would really like to see the bill revised, in particular as I've mentioned, to be much more patterned after the Executive order of setting up the Office of Defense Mobilization.

Senator JOHNSTON. It really amounts to nothing more than a study until we're willing to give it the power and authority to do that.

Secretary FOWLER. To turn to the question of public resources, that is what is available on public lands and what is available in the Elk Hills Reserve and so forth. That I can see as a somewhat different

problem. I can see that the Congress would like to have a program presented to it because it has the responsibility for determining the rules and regulations pertaining to the disposition of Government property, which is the constitutional authority confided in article IV of the Constitution.

That's a very delicate and special responsibility, and I could see why this bill is constructive in that regard in that this Board would prepare a specific program and then come back to the Congress for legislation in that regard.

Senator JOHNSTON. Are you speaking also of the Outer Continental Shelf?

Secretary FOWLER. Yes, where it has the authority.

Senator JOHNSTON. Let me interrupt you here.

Secretary FOWLER. You may draw a distinction between what happens on the Outer Continental Shelf where it's a matter of licensing, et cetera, et cetera, and what is owned on public land.

Senator JOHNSTON. I do draw a very clear distinction.

Secretary FOWLER. I do see that where the public patrimony is involved, the Congress would want not to turn wholesale, that responsibility over to a delegate executive agency and just leave it entirely up to them.

However, what I would think of as the private sector, it seems to me that the bill could be a lot sharper and a lot more focused in giving responsibility, rather than the current language.

Senator JOHNSTON. Do you think that by putting the Federal Government in the business of exploration on the Outer Continental Shelf, that's calculated to make exploration take place faster?

Secretary FOWLER. I really can't answer that question. I'm not enough of a technician to know what's involved in the process to give a valid answer. I just don't know.

Senator JOHNSTON. Mr. Woodcock, if this question is fair, how would you weigh the success of the automobile industry and competitiveness of the automobile industry with that of the petroleum industry? Which is the more competitive?

Mr. WOODCOCK. If one looks at the number of companies, one would have to say the petroleum industry.

Senator JOHNSTON. And, in terms of technology, wouldn't you also say that American technology in oil and gas is clearly superior to the rest of the world as compared to the American automobile industry?

I see a lot of Mercedes and Volkswagens around.

Mr. WOODCOCK. I'm afraid that I would have to agree with that, Senator. I don't want to agree with it, but I'm afraid I have to.

Senator JOHNSTON. So, there's a case to be made of getting the Federal Government involved in something. It seems to me that the automobile industry would be more of a prime candidate than the oil and gas industry, wouldn't it?

Mr. WOODCOCK. It's not as basic to the security of the Nation. In World War II we went for 4 years without building any automobiles. Now we're finding again that the Nation can get along without having an outpouring of automobiles. It has an economic effect, but it doesn't have a security effect, and of course we're advocating intervention in the automobile industry. We're advocating fuel economy

standards, which also goes to the energy question on the conservation side.

Senator JOHNSTON. I do agree with you very much on that. It's interesting to me that Detroit would have not seen this trend coming and responded to it voluntarily. Perhaps not voluntarily, but responded to it out of profit motivation, not just this law but the shortage.

Mr. WOODCOCK. What surprised me is that when the crunch hit in November 1973, the automobile company that was caught most flat-footed was the one that you would think would have the greatest intelligence gathering capacity, namely the General Motors Corp.

It was then that I came down to find out what can we do about energy? What can we do about oil? And, found some 62 separate Federal agencies all dealing with the question, mostly in isolation one from the other; sometimes in opposition one to another.

I find that a very distressing fact.

Senator JOHNSTON. Mr. Nathan, you state rather knowledgeably about incentives in the oil and gas industry. I take it you do know a good deal about the gas and oil industry?

Mr. NATHAN. A fair amount.

Senator JOHNSTON. As I understand the thrust of your testimony, it was to optimize production and get rid of bottlenecks through Federal coordination, planning, and goal setting, but not through operation.

Do I understand that correctly?

Mr. NATHAN. I think that's right. I think there are a lot of ways to shape and move things.

Sometimes the Government has to move in and direct but most often if you operate your incentives correctly, for instance, if you go with the Outer Continental Shelf leases and you require pretty strict time schedules, you're going to get results through the private side.

The trouble is, quite frankly, the industries often resist, like the Devil, the setting of strict standard. I'm sure if a bill came up from the floor and said now we're going to lease these areas—I'm now talking within reason—

Senator JOHNSTON. Development standards, you're talking about?

Mr. NATHAN. Yes, reasonable standards. They're going to try to lengthen it, and I don't blame them. This is where the self-interest comes in.

The problem, Senator Johnston, is how do you reconcile the national interest itself. I'm all for trying to shape incentives and shape regulatory standards and the like.

The automobile industry is going to come around to small cars, or at least less gas used, whether we do it by standards or taxes or whatever it is; but the truth of it is they're not going to do it on their own.

Senator JOHNSTON. One of the specific issues in this bill and its endorsement is the creation of a plan for Federal exploration on the Outer Continental Shelf. Do you favor that or do you oppose it?

Mr. NATHAN. If the word, as I saw it in the summary, of the carry out of Federal exploration literally meant the Federal Government gets jigs and goes out there with drills and drilling equipment and does its own hiring and everything else, I have doubts about it.

I see no reason why the Federal Government may not contract out exploratory wells which then become part of the leasing operations of the private companies.

Senator JOHNSTON. Do you know how much money that would take to explore?

Mr. NATHAN. Some of these wells run into \$50 million dollars in the real depths.

Senator JOHNSTON. Do you know how much money it would take to carry out meaningful exploration programs?

Mr. NATHAN. No. I'm sure it would be in the billions though.

Senator JOHNSTON. Do you think the Federal Government could do that faster?

Mr. NATHAN. I doubt it. I think if you have the right incentives—I would be very strict on timing—I wouldn't let anybody get a big hold on a huge chunk of the Outer Shelf and sit there for 10 years or 5 years and do nothing, which is what often happens.

Senator JOHNSTON. We're talking about Federal exploration. The Federal Government deciding where to drill oil, and contracting for it.

Mr. NATHAN. I would move the other route. I would go the leasing route with strict requirements to move and drill and I would also like to see some of our leasing experimented on the basis of percentage of gross receipts. In other words, let the Federal Government participate.

Senator JOHNSTON. I very much agree with that. As a matter of fact, the bill we passed in the Senate last year provided for alternative methods for leasing, including net profit leasing instead of just bonus bidding.

One final question. In regards to incentives, is the Congress doing anything right now for the repeal of depletion or repeal of foreign tax credits? Do you have a position on that?

Mr. NATHAN. Yes, I do. I do think there have been a lot of incentives provided, not by the Congress entirely although they could have changed the ruling of the Federal Power Commission in terms of freeing the price of new oil and the Federal Power Commission just raised the price of new discoveries of natural gas very substantially.

I, myself, feel the depletion on independents ought to be retained at this stage, because I do think we've got to go for discovery.

I don't see the big ones that have the distribution mechanisms and refineries being continued to be allowed to have the depletion.

On the other hand, as far as the taxes off shore, I do believe that some of the big companies have sort of maneuvered around in their own very marked interest, incompatible often with our national interest, and I don't see the need for incentives in terms of investment abroad.

I think incentives are needed here, and in view of the fact that 85 to 90 percent of the drilling is done by the independent producers of less than 3,000 barrels of oil a day, or 18 million cubic feet of gas per day, with some hesitation, I think I would favor retention of the depletion for these independents to accelerate the exploratory process at this time.

Senator JOHNSTON. I think that's a great statement because I happen to agree with it.

Gentlemen, we've got to vote and either Senator Jackson or I will be back in about 5 minutes.

[A short recess was taken.]

The CHAIRMAN. The committee will resume.

Senator Johnston and Senator Glenn will be here momentarily.

My concern here is how are we going to find the managerial know-how on a vastly expanded and stepped up effort to start the first exploratory work, the drilling, and the production in such areas as the Outer Continental Shelf in Alaska. The fact is only a limited number of companies have the resources and the capabilities, at the present time, of moving into these areas.

My understanding or recollection is there's probably about 18 companies that have the capability of providing a joint venture, speaking now from the standpoint of the managerial requirements of World War II, and the Korean conflict.

In World War II, the Production Board, if I'm not mistaken had the War Plant Corporation?

Secretary FOWLER. Defense Plant Corporation.

The CHAIRMAN. The Government built the plants and then they were leased out.

One suggestion would be that when you've exhausted the availability in the private sector, and that wouldn't take long, that the existing companies and the Government in a joint venture with the independents bring in, on a consortium basis, or joint venture basis, new entities for purposes of development and production as one alternative.

I would preface that by saying in connection with the Outer Continental Shelf, I'm convinced that in order to establish creditability regarding the oil that is there, the Government would do the initial exploratory work in the areas of critical environmental concern.

I met with the Governors from the coastal areas and their feeling is that if you go ahead and award the leases to the private companies, then the private companies feel they must go right ahead and do the drilling and production, even though the area is going to be very fragile and we have a real question of trade-off.

My own view is that in these areas of critical environmental concern on the Outer Continental Shelf, that's where the problem with environment exists, that the wise course is a two-stage affair with the Government doing the preliminary exploratory work, the geophysical work, preliminary drilling to find out what's really there and not make a final decision until we know what the trade-offs are.

I hope I make myself clear. The big controversy on the Atlantic coast, and especially off of California, is that the Government is going to go out, do all this leasing, and it will be an act of finality, and the companies will go ahead because they have paid for the leases, obviously. They will want to get their money out.

The end result could be some very bad decisions. I'd like to have your comments on the first point and the second. The first point being, of course, the whole question of providing the managerial competence to expand in the shortest time possible a program of exploratory work of the necessary preliminary production, and then production of the oil and the gas from these areas, in view of the current limited availability of managerial know-how.

Mr. NATHAN. I have to admit that I'm concerned about the mobilization of that competence and talent on the public side, too.

Where is the directing agency going to get the know-how, the equipment, the management? I think you can always get the technicians. The management is a much different subject.

The CHAIRMAN. The managerial know-how, I think is the key.

Mr. NATHAN. The idea of the Government taking the responsibility for the exploratory doesn't bother me, but I certainly think it doesn't have to be done by Government employed, and Government-owned operations. A lot can be done by contract.

The CHAIRMAN. The whole Manhattan Project was done on a massive scale by private contractors, but what I'm getting at is you can get drilling, if the Government is going to do the drilling, obviously the Government would have to let it out under private contract.

Here again though, we have a number of drilling companies, when you talk in terms of what we're talking about. So, you have that problem even if the Government, the Corps of Engineers, Leslie Groves, and that massive production effort was done under the direction of the Corps of Engineers, here is all this oil and gas. How do we get it in the shortest time possible, and the objective is to self-sufficiency to break the oil cartel price structure. If that price doesn't come down, we're in trouble.

We have two witnesses before my investigative committee who made this statement and said that if the price of oil—and that was Dr. Wallach of the Federal Reserve Board and Alan Greenspan—and they both agreed that if the price of oil stays at current levels over the next 2 years, within 2 years time you could have national bankruptcy.

This testimony was along about October.

Secretary FOWLER. I don't agree with that testimony, as of today, I think a good deal has happened since October to give me more confidence in the situation—I would have been as pessimistic if you asked me that question a year ago, but I think there has been some constructive development in relatively recent months.

Let me cite a few things that have happened. In the first place, there has been a recognition, both within the U.S. Government itself, that you can't rely entirely on market forces to handle the recycling process.

Therefore, you have a second, so-called Witteven Mark II, which is a project by which the International Monetary Fund had a standby fund to deal, or assist those countries, the importing countries, who may get into financial difficulties because of the price of oil.

Second, in November Secretary Kissinger made a very significant statement in Chicago in which he came out with the so-called Safety Net Project, the creation of a joint fund of \$25 billion under the aegis of the new International Energy Agency, which could be called upon—it was a standby fund, but could be called upon to deal with this kind of situation people were apprehensive about, for that time, having to do with the Italian situation, or in effect, the potential inability of a given country. Italy was a typical example.

Now, we are on the way, in both of those instances, in providing some kind of supplementary—call it what you will—safety net or what not, to handle what I would call a crisis involving a particular country on something other than an ad hoc basis.

Third, the relative price of crude oil out of the Middle East, compared to goods and services that are purchased in that part of the world, has changed in the last 2 years.

The year 1974, prices of everything they bought in the outside world went up. We all know that. We had a worldwide inflation of about 13 or 14 percent.

They have given, as I understand it, a kind of commitment that they will not raise that price of crude oil in the year 1975. And, we know that inflation during that year is going to be up 10 or 12 percent.

So, the relative price, due to these two years of inflation in which the price has been maintained at the \$10.50 per barrel level, is about, in effect, 25 percent, by the end of this year, less than it was before.

What I am concerned about is what Mr. Nathan referred to earlier, what happens in 1976 in the way of the further movement upward of that particular oil price. And, that is much more my concern than it would have been, as I say. A year ago, I would have been concerned about the year 1975, but I think things have happened and I've just mentioned two instances which lead me to believe we can weather 1975 without any major worldwide financial cataclysm.

The CHAIRMAN. Aren't we in a situation, in any event, with the prices staying at the present level, that a number of countries, especially in Western Europe and Japan, will be buying less in the way of manufactured products in the United States due to the balance-of-payments problem?

In other words, our first priority is to buy the oil to run the country on. The second is food. And then they start chopping off, so the recessionary effect has yet to be fully felt.

Secretary FOWLER. It has not been fully felt.

When you say national bankruptcy, that's the point I would not be as concerned as I was 6 months ago, or certainly a year ago.

The CHAIRMAN. That's very helpful.

Mr. NATHAN. Could I just add one point. I think the recycling and handling of the balance of payments could be managed if you had a little more vision and a little more willingness. I think we haven't done badly through the Monetary Fund on some of the recycling of funds, but the problem isn't here in the U.S., in full measure.

What you said about the recession, of course, bothers me because I think the United States now is exporting its recession in a very vigorous manner.

I was in Korea about 4 or 5 weeks ago and they were hurt by oil, when they went from a quarter of a billion dollars for oil imports, to \$1 billion, from 1973 to 1974.

But, they were not doing too badly. They were stretching this way and working that way, but then on top of that problem, to have the U.S. recession come along with our inventory, liquidation, and cutting down our imports, they are badly hurt. We're cutting imports way down below production. We're really giving the rest of the world a problem.

The CHAIRMAN. There's a big inventory liquidation underway now.

Mr. NATHAN. And that is really hurting those who export to us. I think it's just as much bad economic management as it is anything

else. In the longer run, I'm not at all sure that the OPEC countries are going to cut their prices because if they're looking at their own interests, they're going to say "if we cut prices 20 percent, there isn't that kind of elasticity of demand."

"We cut our oil prices from \$10.50 down to \$7; that's one third cut. We're not going to increase our oil sales one third. Therefore, we'll get more on foreign exchange and more assets by keeping that price up" if they can maneuver among themselves.

Now, this is going to raise a long-run problem because I think, that the fossil fuel resources are finite and if it isn't 20 years, it's 40 years; if it isn't 40 it's 60.

My own opinion is that you need this agency you've proposed just as much to move as vigorously as we can on pulling together policies with respect to other resources, too, and conservation and the like.

The CHAIRMAN. I'd like to just observe that we left out one area of the world, the Third World, countries like India where it's constant starvation and there are figures about inadequate diet, and people on near starvation diets who run around 400 million.

I saw the figures the other day. It has a devastating impact on countries like India and the price of oil. And, it's just eating into their whole capability of dealing with the needs of their own people.

Many relate that to the rest of Asia and to Africa. And, you'll all agree that that does pose an even more serious problem than is now posed for the industrialized countries.

Secretary FOWLER. No question. There are 40 countries that are nonoil producing countries in the so-called Third World, and who don't have rich stores of other raw materials whose prices have gone up during this last 2 years and those 40 countries represent about 1 billion people and they are the heart of the problem.

They are the ones I think which suffer the most.

The CHAIRMAN. The price of fertilizer determines how many are going to live and how many are going to die. Norman Borlach made this statement, the demographer on population. Some 12 million will die if the price of fertilizer stays at the present level.

It could go up again and raise the price of fertilizer and that would further aggravate the situation.

Secretary FOWLER. Coming back to your original question, I know Mr. Woodcock may want to comment on it, about broadening the base of a number of entities that would participate in this exploration process.

I would just make two observations. I think, first, it's inevitable that you're going to have to go on the exploration of the Outer Shelf with the existing entities in the field. They're going to have to carry the major part of the load.

Therefore, the key issue is what kind of relationships between the leasing, licensing and Federal authorities and the majors, are protective of the national public interest.

Insofar as adding additional entries to the list, whether it's 9 or 18 or whatever it may be, we did have this problem, of course, in World War II and, to some extent, during the Korean war, of providing through the smaller War Plants Corporation, I believe it was called, and also providing through the Defense Plant Corporation, which

Jesse Jones headed in World War II, an opportunity for smaller companies, or companies that were not well established, for example in the aluminum business, in the major way that Alcoa was, for opportunities for Reynolds and Kaiser and others to come along and become major participants in a given field.

That was not only true of aluminum, Bob, it was true of many other areas.

It's a difficult—it's not an easy thing and I would not want, insofar as my own observation goes, to hold out the expectation that you can carry on the exploration process effectively in the Outer Shelf without utilizing, in a very major way, the major companies that are currently involved.

Therefore, the basic question comes down to what kind of arrangements with the Exxons and the Gulfs and the Mobiles and the Arcos and what not, can be devised that will be protective of the national public interest.

As I understand bill 93740, that you've drafted and submitted here, you would like to see a proposal prepared that would be responsive to the need to have a thorough going exploration, an identification of the amount of the reserves that are readily available in that sector, and you'd like to have that program brought up to the Congress and legislated because it is a very delicate and very fundamental question of the national public interest involved.

With regard to the question of those areas where there are already proven reserves, like some of the other sectors that are mentioned here, it seems to me you have somewhat a different problem.

There, it's more a question of being sure that those reserves are in a ready, standby condition so they can be quickly utilized in the event there should be another stoppage of movement on the import side.

I would have, myself, some question about whether or not we should exhaust those reserves under the current circumstances.

What I would be more concerned about would be putting them in a position so that you can almost say they were ready stockpiled for fairly immediate use, in the event there was another emergency.

The CHAIRMAN. On that point, Secretary Fowler, what I had in mind, it makes no sense to have the oil in the ground, the Petroleum Reserve No. 4 in Alaska, in excess of 30 billion; but if we proceed on the assumption that as a reserve, and we find it takes 8 years to get it out—do you see what I mean?

Secretary FOWLER. That's exactly what I mean. If it's going to take 8 years, you want to move on it. If it's going to take 6 months in California to produce it and get it out, that's another problem.

The CHAIRMAN. The key thing is, and let's take Elk Hills. I think we have there over a billion barrels of oil, total; but the maximum amount you can take out in a day is 300,000 barrels.

So, what I would like to see is that we start pumping out all that oil and put it in salt zones so that in the event of a cutoff, we would be able to draw down 3 million barrels a day instead of 300,000 a day.

Secretary FOWLER. That's a very sound stockpiling concept. You're really trying to improvise here an arrangement in dealing with oil in the ground that amounts to stockpiling for ready use, such as we had under the old Stockpiling Act, which I think was passed in 1951.

The CHAIRMAN. Then we have to have reserves and refining capacity. Secretary FOWLER. Right.

The CHAIRMAN. To back that up. So, what we want is a viable and creditable reserve, and this, in itself, will give us greater leverage as far as the cartel is concerned because we'll have the capability of responding.

Secretary FOWLER. I think it's not only important to do that for ourselves but in terms of maintaining any cohesion among the so-called democratic industrialized countries.

We've all got to begin to move in the direction of having something that is equivalent to a stockpile of either reserves on the ground, above the ground, or in some more readily accessible reserve.

The CHAIRMAN. And that is part of the 90-day reserve program, the International Energy Agency Administration. Mr. Woodcock, I think you're about to say something, and I want you to have your comment.

Mr. WOODCOCK. Against the background where the Secretary of State deliberately puts into the international public domain, the possibility that, as against strangulation, we might go to war.

Obviously, this is a grave situation.

The CHAIRMAN. May I say that I have suggested, when that comment was made on two different occasions, we ought to threaten to take our gunboats out. It might be a bigger deterrent than this silly talk of a great power like the United States threatening to send gunboats in as a deterrent.

Mr. WOODCOCK. Against that background is why we think that the Board that you propose should have stronger powers than the bill presently says. It can't be business as usual.

With regard to stockpiling and storage, I think you can make a case. We refer to it in the statement that I submitted that maybe we should take some of the OPEC oil for the purpose of that storage, that stockpiling, instead of thinking completely in terms of exhausting our own resources.

Certainly the OCS should not be on the basis of leasing to the companies so that they are the ones who decide what national policy should be.

I certainly support what Secretary Fowler has said, that we want to bring these domestic sources into a standby condition; because having them in a standby condition where they can be quickly put onstream would have a considerable impact.

We should be going on with a massive effort, in our opinion, on coal, with a great deal of push on the coal that is east of the Mississippi; a massive research program for desulfurization of coal. We shouldn't be putting our reliance on ripping up the West.

The CHAIRMAN. May I say, on the desulfurization, I have suggested to Dr. Seamans, that in this age of the esoteric possibilities of alternative sources of energy, and the great accomplishment of this Nation of sending a man to the Moon and so on, we've done fantastic things, but we have not solved the simplest, what should be the simplest problem of all. A means by which we can either clean up the coal before we burn it or have a process by which we burn it and clean it up at the same time. Would you agree on that?

I've suggested that he give this the highest priority, because we have over half of the coal reserves of the entire world. The tragedy of it is, we can't utilize a lot of that coal because of the situation that we face on the environmental side, the high sulfur content.

Most of your low sulfur coal is either deep down under, or it's way out West, a long way from the markets, and the railroad tracks are falling apart; we have no immediate transportation.

Mr. WOODCOCK. Mr. Chairman, it can be done. The Parma Ohio plant of the General Motors Corp. is burning high sulfur coal and they have a scrubbing process which essentially takes it out; but, it's very expensive.

So the technology is there, it's a question of making it economical.

The CHAIRMAN. We are honored to have with us, as the fourth member of the panel who was detained at hearings over on the other side, Felix Rohatyn, who is an outstanding investment broker and who has taken a very keen interest in the whole issue of energy and especially international economics and the impact of the price of oil on the financial institutions of the western industrialized nations.

We have two investment bankers at the table, and I think we have a good cross section here with a distinguished labor statesman as well as an economist.

Mr. Rohatyn, we'd be delighted to have your comments. I must say, you have an excellent background, covering our experience in the Korean war and mobilization efforts in World War II, and all four gentlemen, and Mr. Falck, who is a counsel in the election board, have alluded to that effort, and have discussed the applicability of those lessons in connection with our present proposal here, the National Energy Production Board.

Mr. ROHATYN. Mr. Chairman, let me apologize again, for being delayed. I'm honored to be here, and if you will just indulge me, I have a very short statement that I might read into the record.

The CHAIRMAN. Very good.

STATEMENT OF FELIX G. ROHATYN, PARTNER, LAZARD FRERES & CO., NEW YORK, N.Y.

Mr. ROHATYN. I appreciate the opportunity to testify on behalf of the National Energy Production Board. For over a year now, since the Arab oil embargo, we have talked about "Project Independence" to make the United States free of dependence on foreign source energy within a decade, but we have really, so far, done nothing to implement it. The main causes for this inaction seem to be the uncertainty of the private sector with respect to future pricing and governmental policies, and within the Government, the scattering of authority with respect to energy matters, which always seem to result in a series of countervailing forces.

Many projects that were started looking to the development of alternate sources of energy, such as shale, Alberta tar sands, coal to gas conversion, have been postponed or abandoned because of soaring capital costs. If we are serious about "Project Independence," a massive effort involving some sort of partnership between the private and public sector will have to be undertaken. This will involve new

structures and new entities, both for exploration and production, as well as for financing.

At a time of continuing economic downturn, such a program, if undertaken on a sufficient scale and with sufficient urgency, could play a major role of speeding recovery and reducing unemployment. This would be true as a result of the capital spending generated by accelerated exploratory and development drilling in new domestic crude reserves, be they in Alaska or off the Continental Shelf, as well as the employment and capital spending generated by accelerated shale, nuclear tar sand and other alternate source developments.

The National Energy Production Board would seem to be the first essential step in such a program. It would centralize in one place the presently scattered Government inputs to the energy program. It would give a sense of urgency and focus to the Nation's will to be independent. It would create a climate more likely to convince the OPEC countries to take a more reasonable position on pricing, and possibly to negotiate long-term contracts at considerably lower prices when faced with a realistic alternative of a determined United States of America. The fears of many that such a Board would put the Government in the oil business to the detriment of the private sector, do not seem to me to be well founded. When President Kennedy called upon the Nation to undertake Project Apollo, to put a man on the Moon within a decade, and put the program under the management of NASA, no such fear was expressed of having Government interfering in private business. Indeed, the role of NASA in connection with Project Apollo and its cooperation with private companies to achieve its result, could be used as an example in the ability of the public sector to work with the private sector in the realization of massive industrial projects.

A basic requirement to go along with the National Energy Production Board would be a financing arm which would provide large scale financing to the energy program. Moneys provided for the National Energy Production Trust may be adequate for initial exploration, but there would seem to be no question that significantly greater amounts will be required for production and for the financing of alternate sources of energy.

In that context, one might consider the creation of an Energy Finance Corporation (possibly within the framework of a new RFC). The Energy Finance Corporation could, I think, be 100-percent owned by the U.S. Government or, like Comsat, be a mixed private-Government corporation. Its Government guaranteed obligations could be sold publicly and quite possibly could be used as a recycling vehicle for excess funds accumulated by the OPEC countries. It would provide for the financing of new projects which would be privately managed along the lines of the Canadian Government's involvement in the Alberta tar sands project in partnership with private companies.

The National Energy Production Board that could cut through logjams, and has talent and financing capability, can get the United States moving toward energy independence and provide great stimulation to the economy.

Since, ultimately, the projects it would finance would create new wealth for the United States, the net result would not be inflationary.

Due care to the environment could be exercised in partnership with State and county government; fair sharing of revenues between the States and the Federal Government can be worked out. The key is to get moving and to get moving rapidly.

The CHAIRMAN. Thank you for an excellent synopsis of the opportunity that exists here. I think there is a general accord that what is needed is to bring together, within the Federal structure, all of the Government resources to bring to bear the kind of mobilization that we need to get the production.

May I say it comes up from time to time in the discussion here, but I think we're pretty well structured as far as ERDA. What happens there is I like to keep it separate from the Board, so what happens there will depend on the willingness of the administration to spend the money, invest the money that will be needed in order to build a large prototype plant.

The discouraging thing is that a number of the oil companies that have gone into the oil shale, I think two of them have withdrawn.

Senator Glenn, you were following those hearings; is that not correct?

Senator GLENN. That's correct.

The CHAIRMAN. And they have withdrawn, which means the main brunt of the capital investment problem will rest with the Federal Government. They want to utilize their present cash flow in connection with the conventional requirements for oil. I think that by the time you get through Senator Glenn's statement of special interest in this, and we have funded annually, the administration's request is totally inadequate in dealing with conversion of coal to natural gas, to petroleum and so on.

I think we can handle that separate from the Board, keep the Board really on top of the coal, oil, and natural gas effort on a massive production basis.

Whereas the research and development part of it, such as we had in World War II, Dr. Busch's operation, and the other programs that were kept separate, I believe Secretary Fowler from the War Production Board—

Secretary FOWLER. Yes. I was going to say, Mr. Chairman, I agree with that distinction that you made, and that is the way we functioned in World War II. We had Dr. Busch and the National Research and Development Authority, and I would agree with you that I think the Board contemplated by your bill has so much on its plate in terms of the conventional problems that are there in front of us, that it makes sense to separate the longer term research and development phase, as the Congress has done in this separate Agency.

The CHAIRMAN. But I want them to go all out on the question of the utilization of coal, Senator Glenn, to be able to put it on their boilers and come out with a clean product. I think this is the greatest tragedy of all.

I will now turn to Senator Glenn, who had to go over on the floor for the votes.

Senator GLENN. I do apologize for being gone longer than I intended. We are extremely busy on the floor today, as some of you may have followed. For your information, we failed to pass the tax bill by

one vote. So there's a lot of maneuvering going on at the moment to see how we recommit the tax bill and what form it will be coming back alright at the moment, and that is what is being hassled over there right now. Whatever stimulus we're going to give to this economy, we need it now. We're going to be in just a whole different ballgame, and I know that that isn't our subject this morning, but I think that unless we get the thing going now, we're going to wind up instead of debating now whether it's 21 or 29, and if you wait much longer, then all this subpay that you're involved with Mr. Woodcock, the unemployment benefits, will start phasing out very shortly. We'll be talking about 30 to 40 instead of 20 to 30, very shortly, if we don't get something going.

I'm glad to be back. Mr. Rohatyn, whom I knew before, I'm very sorry I missed your statement on this, but I'll certainly get it in the record here.

There are a couple of threads running through the testimony here, that I want to get a little more information on. Senator Johnston, the Senator from Louisiana commented on some of these things earlier that I'm interested in.

I'm a little concerned that where we give authority, really, to this new Board could really go to something positive and clear-cut and physical. That is to get on with Federal property and the Outer Continental Shelf on oil, gas, coal; actually going ahead with programs to get the energy out on those area, and other areas.

It would appear that we could review, monitor and report for further information by the Congress. Now, as I see it, this is a considerably weaker position, Mr. Fowler, than you had authority to do in your earlier experiences. Would you care to comment on that?

Secretary FOWLER. Yes I would. I would much prefer and would recommend that the committee consider with reference to these other more ordinary, normal activities of mobilization, the pattern of Executive Order No. 10193, December 16, 1950, which set up the Office of Defense Mobilization.

I'd like to read two paragraphs from that Executive order because I think they epitomize the difference between an action-decisionmaking body, which is what we needed here and a body that surveys and develops recommendations and options and so forth.

Paragraph No. 1. I'll omit reading.

Paragraph No. 2. The Director shall, on behalf of the President, direct, control and coordinate all mobilization activities of the executive branch of the Government including, but not limited to production, procurement, manpower, stabilization and transport activity.

Paragraph No. 3. All functions delegated or assigned by, or pursuant to the provisions of Executive Order 10161 of September 9, and 10172 of October 12, 1950 shall be performed by the respective officers concerned subject to the direction and control of the Director.

Now that paragraph referred to two previous orders which had set up the National Production Authority and various other mobilization units in other departments of the Government.

So, I do think the bill is defective insofar as what I would call the normal mobilization pattern here in the field of energy, in not giving power of direction to the board or to the chairman of the board, which would be my preference. I think the War Production pattern was very preferable.

Senator GLENN. I appreciate your comments because I had a feeling awhile ago when I was listening to testimony here that you're all testifying for a very strong control, and that is if we're going to do it, let's do it as we did it back in World War II, and in the Korean days.

And, it was sort of an assumption that that's the direction we're going with this. I think the language of the bill does not necessarily go down that line except on Federal property on the Outer Continental Shelf. So, I think there's a very substantial difference here. I would hate to see this established, this board, with people expecting it.

Now we have somebody that can really direct this thing and get this whole energy thing back on track as if it were a wartime situation, and I think it's every bit that critical myself.

I would not want them to think that we had that situation established when we actually did not, that we've just given it the very limited function of Federal lands and the Outer Continental Shelf.

So, I'm glad to have your distinction here between what you see this bill doing and your experience with other boards earlier.

Does anyone else want to comment on any particular point?

Mr. NATHAN. I would rather, if it were not feasible to get a board with the authority that Secretary Fowler was talking about and which I share—and I would really put some authority in there—then I would prefer taking what is in this bill as a starter because I'm convinced that with the right kind of board, not just with the authority on Federal lands and the Outer Shelf that's implied here, and the monitoring, you will have some real responsibility in a programmatic way and a policy way.

Title IV is a tremendously important one, one of acquiring expressed legislative authorization. It directs this board not just to request, but to prepare these programs.

I think you've got a leverage here that would lead to the operations that we're talking about, in case a full operational responsibility couldn't be feasible at this time.

I'd rather have something like this, if you can't get the full operational. I think we're going to come to the full operational.

In my judgment, Mr. Chairman and Senator Glenn, I think if this were to go this way, I'm convinced that within a short period of time there will be central authority and not just central focus because of the urgency of the problem.

Then I think we're probably going to come up with something else. That's like the Office of War Mobilization, which came late when they saw that the War Production Board could do a lot but it couldn't coordinate diplomatic strategy and the international strategy with all of the domestic. We had a civilian agency, the OPA, on the side.

So, my guess is that sooner or later this problem of whether the research has been adequate, whether it's really being followed through, and whether FEA does its job, may require a White House kind of coordinating body like we had in the Office of War Mobilization. It came right up to the top. It was never operational, but it was a real policy powerhouse.

In the meantime, I would much prefer one with some real authority, Senator Glenn, but if you can't get it, we've got to get something started.

Senator GLENN. We would have authority in certain areas, and it would be more of an information gathering agency in others to separate it out. I think that is an important function, too; because the second thread that I mentioned earlier that runs through your testimony is the lack of any one central spot for information.

That has been rather appalling to me ever since I arrived here and I've heard testimony on the whole energy situation and I find there is no unanimity of agreement of what our situation even is. You use API figures, Stanford Research figures, committee figures and figures from the floor over here, and all different figures. And, you can be the most trusted, most confident economist or investment banker or labor leader, or Secretary of the Treasury or what else, and you can pick a source of information and prove anything you want to prove in this area and draw up a plan that can use those figures for substantiation.

If we had one source of information we could really rely on, that's what we need. We've commented on this repeatedly when other witnesses have been here. I don't mean to give a speech for you, because we're here to get your comments, but the lack of one area of information that we can really hang our hat on, and then go out and say here's legislation, and here's the figures to back it up, and this is what we're going to do, because these are the facts.

We just don't have those. It's sort of a morpheus area. We punch it here and it squirts out here, and you hope you took the right track but you don't know because the information is not that good.

I see one of the values of this, even though it might not have the clout and the overall authority to do a War Production Board type direction, I see as some value if we could at least get some half-way decent information figures that we can rely on.

I think that thread is run through your testimony here.

Secretary FOWLER. Yes. I agree with Bob that the programing and policy functions are of course the fundamental importance and it's implicit in my suggestion that this office would have, and carry out, that informational programing developing a specific plan.

It also, I think, needs to have the action to direct those activities of the Federal Government and to mobilize private sectors in an action program, or else there's too much opportunity for decentralization of responsibility to amount to defeat.

Senator GLENN. As you see it, and let's take a hypothetical case here; this board was established, and say you were on this board, would you like to see this board have cognizance over directing ERDA in some of its activities? It would have the authority to go down and say ERDA you should be putting more money over here in certain areas and to direct their activities, and the same thing with FEA?

Secretary FOWLER. I would certainly want to, as a member of the board, or for the board to certify to ERDA that it should give a very high priority to the treatment of desulfurization of coal. I would expect somebody over there to take that officer seriously.

If 3 or 4 months later nothing has happened, there would be some shaking and jumping.

Senator GLENN. Would you have direct authority over them, to direct them to do that?

Secretary FOWLER. There, I don't recall precisely what the channel of command was between Don Nelson, as head of the War Production Board, and Dr. Bush, R. & D.; as far as those two men, those organizations were concerned, I don't think it ever came to a point where something the board certified was important research activity that they did not go forward with it. There wasn't any question about it.

I think once you have authority where there is a locus of responsibility, you don't have to issue directives very often. You get the coordination, but if you don't have the authority ultimately to give the directive, then you have your failures of coordination; you have your interagency struggles and bafflements.

It was the presence of that word in the Executive order, "direct," which minimized a lot of the, more or less, internecine difficulties that we had in World War II. We didn't have them to the same degree during the Korean mobilization.

Senator GLENN. Mr. Woodcock, you started to make a statement here and I got going on my pet peeve here and cut you off. I apologize. Please continue with what you wanted to say.

Mr. WOODCOCK. Senator Glenn, we favor a strong directing board, but I certainly agree with what Bob Nathan says. If that isn't possible, then we certainly would like to see something such as this because I think it would take us to that point.

If I may take advantage of this time, the chairman spoke about a Third World and I intended to say something with regard to that.

I was on the Advisory Committee to Project Independence, and I think the term "Project Independence" was a political name. It wasn't something in being, because we're not going to have that kind of independence, but we can have a much better mobilizing of the resources that we do have as we go about doing that, having domestic alternatives.

We then are in a much better position a la OPEC, not simply for the breaking of the cartel and putting them back into their days of exploitation, because they have grievances on their side, too.

But, then you look at the Third World. If we have a reasonable relationship between the producing countries and ourselves and the common market and Japan, then it can become a common problem of a Third World because they're in a great position to help, too.

It isn't a question of contending for control over the Third World to be in a cooperative relationship to the solving of the problem of the Third World.

Senator GLENN. I have just two other areas that I want to explore very briefly.

Mr. Fowler, you mentioned Presidential authority in your statement as item No. 1. All the other things sort of hung on that. Your item No. 1 was the absence of authority delegated to the Congress to deal with the situation.

The other things that followed that, the two, three, and others sort of followed that up. Do you feel that the President does not have that authority now?

I have felt for some time that if the President really felt so moved, he could move very strongly, and positively in this area, and we probably would not have been sitting here debating an NEPB.

Do you think he really needs authority to do this?

Secretary FOWLER. I didn't have the opportunity to go into any kind of detailed research on all the existing legislation that's on the books to know whether if I were in the organization of budget and management I could corral together all those bits and pieces of authority and put it in an Executive order and delegate it to one person, and have a workable organization. I haven't done that degree of research.

It is my impression, however, that when you add up all that he does have, it falls far short of what President Truman had given to him by the Congress in September 1950 in the Defense Mobilization Act of 1950, together with the tax amortization legislation and the Revenue Act, which was passed at the same time.

President Ford does not have today, that authority to the extent that it exists, but as I say, I haven't done my homework, or my research, so I could stand corrected.

I sense this situation, as I read in President Ford's message to the Congress on January 15, he says within the next 10 years, by program envisions 200 major nuclear powerplants, 250 major new coal mines, 150 major coal fired powerplants, 30 major new oil refineries, 20 major new synthetic fuel plants, the drilling of many thousands of new oil wells; the installation of 18 million homes; construction of millions of new automobiles, trucks, and buses that use much less fuel.

Now, if that's his program, either he hasn't got the authority, or if he has the authority it isn't being exercised because we aren't moving toward these figures or anything like these magnitudes that are set out here in this message.

The CHAIRMAN. I might point out that in the omnibus energy bill that we passed last year, and President Nixon vetoed, he even vetoed the provision that gave the President the authority to allocate critical materials.

You can't even get the materials for the drilling rigs because of shortages. Well, now tubular steel, and some other things are coming out, but tubular steel is not available.

So, the authority is totally lacking and they vetoed the granting of authority to do something in the materials area.

Secretary FOWLER. I think you note from my statement, that I said in dealing with this point one, which developed this absence of authority; whether this absence is due to the failure of the Executive to ask for the authority or the Congress to grant it, is not for me to say.

Who killed Cock Robin, I wouldn't want to answer that question. But, it's very clear to me that there is not a reflection of that authority the President needs in the actions that are going on today. That is the principle point I want to make.

Mr. NATHAN. As an old bureaucrat, I'd say give me an aggressive leader without authority any day, over a timid soul with authority.

I think there's no question that some of those goals the President formulated in his mid-January speech about certain achievements, quantitatively. He has the authority just to direct those and get them.

I think he could get all the authority he wanted in this crisis if it were asked for. I think the problem is, I regret to say, that around the President a lot of people just don't believe in any Government

activity. They don't believe in the Employment Act of 1946, and they just believe in the marketplace—that if you just get out of the way, it will all solve itself, which is just nonsense.

Mr. ROHATYN. Senator, I think, to support some of his points, I think in order to be creditable and in order to get moving, you're going to have to create some businesses here. You're going to have to start business, or in effect, you're going to have to guarantee their functioning.

You don't have capital available or you don't have risk capital available in the magnitudes that are going to be needed here.

And just as I think during the Korean war, you really created part of the aluminum industry in this country by having the Government guarantee the take output, if such output couldn't be marketed.

You may have to do the same thing to put people into the shale business.

But you just have to go do this in order to be creditable, and in order to be believable you are going to have to have a mechanism which says we have the authority to do it and we're going to start and we're going to do it.

Senator GLENN. Let me ask another question, and this is a leading question and I know it will probably develop an argument on the panel here possibly between Mr. Woodcock and some of the rest of the gentlemen here, and I don't propose to start that type of altercation at the moment because we do have to go vote in a few minutes.

But, in this area that you talk about, where we're going to have to create new companies and so on, I have felt that we have a tremendous investment potential in this country that is sitting there for lack of any certainty of Government policy, or lack that they are flat out scared to do something because they don't know.

And, uncertainty is the worst thing in the investment community. When they are uncertain, they do nothing.

So, we have a huge potential of getting out and doing things that is just untapped by a lack of some confidence and a lack of information, which I talked about a little while ago, lack of having confidence in that here is our policy, we can rely on it for the future.

And, it's just a tremendous area. Mr. Woodcock, in his statement, proposed that the private investment returns are quite adequate and what we need is more direct Government intervention in this area. Maybe that's what's needed, I don't know.

Would you care to comment on that?

Secretary FOWLER. Insofar as the nonconventional energy sources are concerned, that's the development of shale, the setting up of synthetic oil plants, synthetic gas industry, I would have the feeling that unless you have financial incentives that do not now exist, you're not going to get sharp, rapid movement in the organization of production and the dedication of private capital in those activities under the present situation today.

You might get it over a long period of time.

Senator GLENN. Tax incentives, or direct subsidy?

Secretary FOWLER. I would say, for example, both the tax amortization, the 5-year writeoff pattern that we followed, plus the take-or-pay contracts that Mr. Rohatyn referred to, those were the galvanizing instruments in getting expansions of capacity, or new capacity to

develop in both of these periods, which we simply wouldn't have gotten if we didn't have those instruments and those certificates, you might say.

Senator GLENN. Just as a matter of philosophy, I think I'm dedicated to the principle that we try to do so many things for the taxing system to accomplish so many different ends that we gradually have made it so complicated that it's bordering on being unworkable these days.

I'd like to see us have guts enough, if we're going to go out and do some of these things for a direct subsidy that need to be done, and not institutionalize it with all this tax things that we complicate our system with. And, that's just a comment as an aside here.

Mr. WOODCOCK. I would prefer the direct subsidy system, Senator, as I've been so saying.

Senator GLENN. Mr. Chairman, I've finished with questioning here. I appreciate very much you gentlemen taking the time to be here this morning and I wish we did have a lot longer period of time because your testimony is extremely valuable and we appreciate your comments on the questions I've asked here, and we might want to follow this up with letters or other questions to you at a later time, and I hope you will be responsive to those if we do have other questions.

The CHAIRMAN. I wanted to say, Senator Glenn, that I think we'll want the panel, hopefully, to come back. I found this very constructive and I wanted to say, in connection with title IV, as one example, that this was simply a working draft, and the bill was a working draft.

I think after we've had an opportunity to go through your testimony, we'll be in a better position to draft some new amendments, alternate language, and the reason why we asked the four of you to come is because we thought you were the four best in the Nation to address this question, at this point, as we begin our hearings.

Of course, we want to move on this and we want to get experts in the specific areas in and we will, I trust, be able to get a bill out sometime in May, after we really have continuous hearings after the recess.

I will be calling on you for advice and counsel, if you don't mind, as a part of the working group, in this effort.

I found it extremely helpful, but I do want to say this is a working draft. It is not final. I would prefer vesting the full authority in the Board and in the Chairman, so you can have real management control. This is a compromise and I don't think we can leave too much to come back to Congress because only in certain critical areas should the matter be referred back to the Congress.

Would you agree, gentlemen?

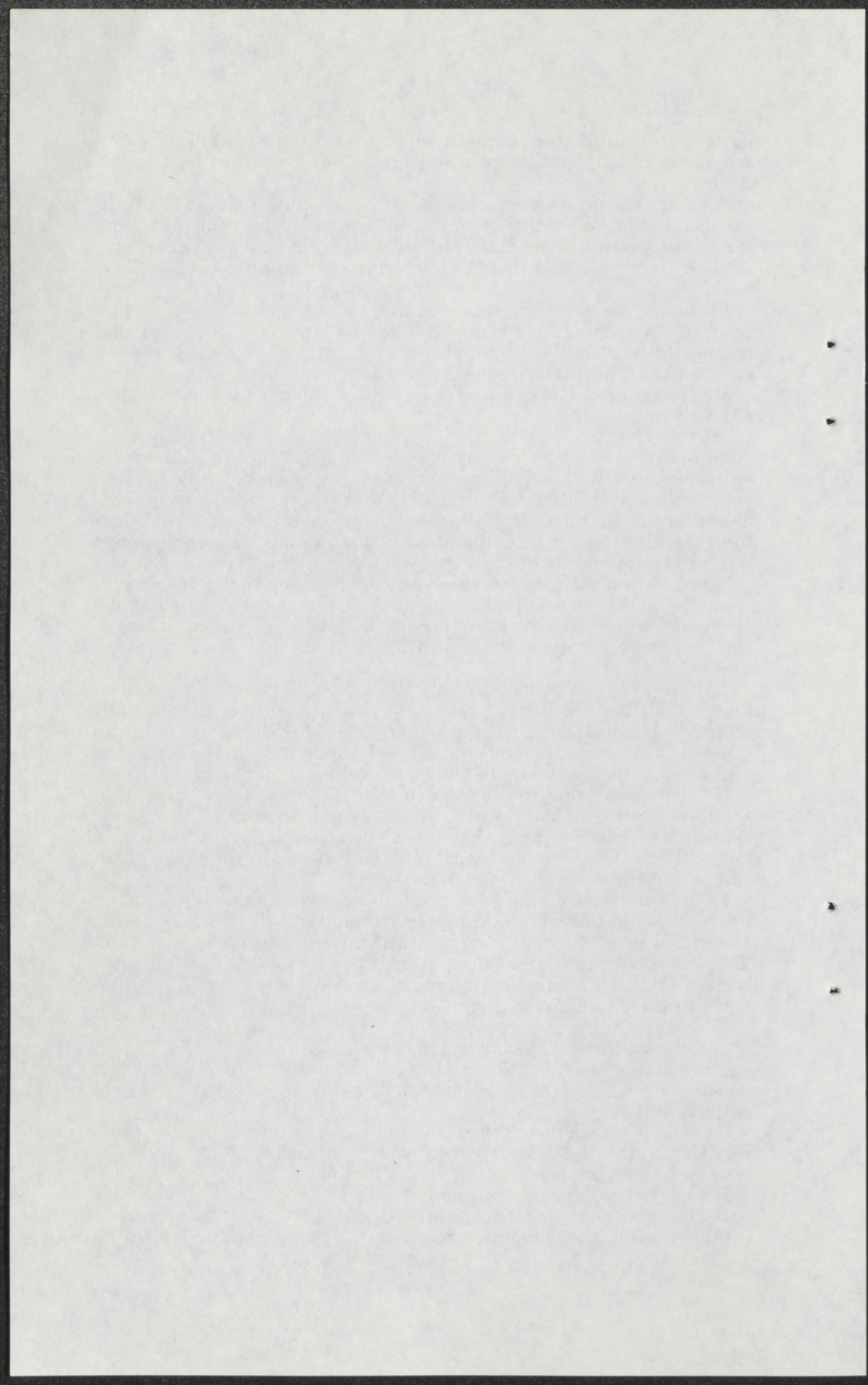
Secretary FOWLER. The public lands area, I think—

The CHAIRMAN. Yes. You get into certain sectors of this problem where the public interest is such that there is a reluctance to delegate without authority.

One thing we can do is delegate it and then reserve the right to override that authority. I know we raise constitutional questions, but it is a check and a balance.

I want to compliment each and all of you for your help and your participation and regret that we have to go.

[Whereupon, the committee recessed, to reconvene Monday, April 14, 1975, at 10 a.m.]



NATIONAL ENERGY PRODUCTION BOARD

MONDAY, APRIL 14, 1975

U.S. SENATE,
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS,
Washington, D.C.

The committee met, pursuant to notice, at 10 a.m., in room 3110 Dirksen Office Building, Hon. Henry M. Jackson, chairman, presiding. Present: Senators Jackson, Johnston, Hansen, and Bartlett. Also present: Owen J. Malone, professional staff member for the majority.

OPENING STATEMENT OF HON. HENRY M. JACKSON, A U.S. SENATOR FROM THE STATE OF WASHINGTON

The CHAIRMAN. This committee will come to order. We will resume our hearings now on S. 740, the proposed National Energy Production Board bill.

For most Americans one of the most frustrating aspects of the present energy crisis has been the Federal Government's failure to act decisively to develop the domestic oil, gas and coal resources we need to meet our shortages and overcome our dependence on foreign suppliers.

The Federal bureaucracy today is characterized by a jungle of fragmented jurisdictions and responsibilities. The Department of the Interior sits astride the public lands and the Outer Continental Shelf, which contain massive coal, oil and gas resources. The Federal Energy Administration is not equipped to mount exploration and development programs. The Department of Transportation and the Interstate Commerce Commission possesses broad authority over the Nation's energy transportation systems, but little, if anything, is being done to improve and augment the capacity of our railroads and other transport to move energy resources to market. Federal regulatory agencies such as the Federal Power Commission and the Environmental Protection Agency play critically important, but essentially negative roles in the energy field. They are unable to initiate development action. Instead, they often delay or prevent development. And to the extent that the Defense Establishment has jurisdiction over energy reserves and facilities, its role is that of a caretaker.

The plain, inescapable fact is that the present Federal bureaucracy is ill-equipped to mount the kind of all-out national effort we need to accelerate domestic energy production and achieve energy self-sufficiency. We need a single, specialized, mission-oriented action agency

empowered to prepare and overcome bottlenecks, and marshal Governmentwide resources for a major domestic energy production program.

History can be instructive in this connection. The national emergencies that confronted the Nation in World War II and during the Korean War period were overcome by mobilizing the Nation's resources under the leadership of the War Production Board and the Office of Defense Mobilization. In other words, when faced with a crisis requiring a nationwide effort the Congress has found it both useful and successful to centralize leadership in special mobilization agencies. The present energy crisis merits the same kind of approach.

The bill before us this morning is a working document. It advances the mobilization board concept as one that should be applied to our energy production program. It provides us a basis for discussion as we search for the most effective approach to solving a critical national problem.

In exploring the National Energy Production Board concept the committee wants the benefit of the widest possible expression of views. On March 20 we were privileged to receive the views of the former Secretary of the Treasury Henry H. Fowler, Mr. Robert Nathan, the Washington economist, Mr. Leonard Woodcock, president of the United Automobile Workers and Mr. Felix G. Rohatyn of the New York investment banking firm of Lazard Freres & Co. They made a very valuable contribution to the record.

Our witnesses this morning are Hon. Mike McCormack, from the State of Washington, and Mr. W. Michael Blumenthal, president of the Bendix Corp.

Congressman McCormack, we are delighted to have you testify before this committee and we know of your keen interest as chairman of the Subcommittee on Energy Research, Development, and Demonstration of the Committee on Science and Technology. We will be pleased to have your comments.

Congressman McCORMACK. Thank you, Mr. Chairman.

STATEMENT OF HON. MIKE McCORMACK, A U.S. REPRESENTATIVE FROM THE STATE OF WASHINGTON

Congressman McCORMACK. Mr. Chairman, I appreciate the invitation to testify today before the Senate Interior Committee and I hope that I may be able to make a contribution to your thinking on S. 740, the National Energy Production Board Act of 1975.

It was my privilege to appear before this committee last year and discuss the solar energy research, development, and demonstration bill, which you, Mr. Chairman, along with Senator Humphrey and many other Members of the House and Senate cosponsored. A great deal of discussion and public debate concerning the energy crisis has taken place since that time, but much of it has completely missed the point as far as providing solutions to this Nation's energy crisis. This is why I consider your bill, Mr. Chairman, to be so very important, why I endorse it enthusiastically, and why I appreciate this opportunity to come before you and testify.

Mr. Chairman, I think the people of this country have now awakened to some of the realities associated with the new era into which we

have moved since 1970, to the fact that this Nation's supplies of petroleum and natural gas are not inexhaustible, to the fact that this Nation is running out of petroleum and natural gas and that these fuels, on which our industrialized civilization depends for its existence, will be exhausted insofar as a significant supply is concerned, by about the end of this century.

In spite of any conservation program that we may establish, it will still be necessary for us to continue to increase our total production of energy, and we are faced with a frightening spectrum of problems associated with that increase in total energy consumption and, on the other hand, the conservation programs that we must simultaneously institute.

For instance, if we were to reduce our annual energy growth rate to 2 percent per year, as the Ford Foundation study suggests—and this may be possible without too much harm to the economy—we must still increase our electric energy production at a rate of 4 to 5 percent per year. A 2-percent growth rate means doubling our energy consumption within 35 years, but a 4- to 5-percent growth rate for electricity means doubling our electric energy generating capacity by 1990.

In addition to an aggressive conservation program, we must undertake an all-out program of exploration and development for petroleum and natural gas resources, on shore and off, and we must establish a systems approach to a comprehensive, integrated national energy policy. This is particularly applicable to the colossal challenge of converting a substantial portion of our energy dependence to coal, and the requirements for capital, manpower, critical materials, transportation, and process water that such a conversion will inevitably require.

We must eliminate the obstacles that are preventing us from getting nuclear powerplants on the line in an orderly, safe, and environmentally acceptable manner, recognizing that the electric energy from the plants that are now operating, under construction, or on order, is equivalent to the energy produced by all of our imports of petroleum and petroleum products today. We must understand and emphasize that nuclear energy is the cleanest, safest, cheapest, and most environmentally acceptable option available to the United States for the balance of this century. We must provide that vigorous research, development, and demonstration programs for solar energy, geothermal energy, nuclear fusion, energy conservation, and environmental protection, recognizing, however, that solar and geothermal energy will not provide a significant contribution to this Nation's energy requirements before the year 1990, nor nuclear fusion before the year 2000.

Unfortunately, most of these points are being ignored, and much of the debate in Congress and throughout the Nation has centered around import tariffs, quotas, gas taxes, allocations, regulations, and incentives. While all of this is important, Mr. Chairman, it is somewhat like wrestling for deck chairs on the *Titanic*. The stark realities are that while this debate has been going on, our oil production is down from last year, our production of natural gas is down from last year, our coal production has scarcely changed from last year, the percent of petroleum we import has now increased to about 38 percent, more railroads have gone out of business, the situation in the Middle East has deteriorated, and some normally intelligent national leaders

insist that all we have to do is conserve energy or even cut back on existing energy production programs.

There are some bright spots. The President has called for more energy production, for additional coal mines, synthetic fuel plants, and having 200 new nuclear powerplants on the line by 1985. The number of nuclear powerplants has increased from 44 to 55 during the last year with a capacity of almost 40,000 megawatts, or 9 percent of our Nation's electric generating capacity. A number of studies have been made by responsible national organizations clearly emphasizing that we must increase energy production.

Several other studies have been completed revealing the relationship between employment levels and energy consumption. This close relationship is, I believe, one of the reasons why we in the Congress backed away from the President's proposal to arbitrarily cut our imports by 1 million barrels per day during this period of high unemployment. I have been trying to get a good handle on this subject. The indicators I have been able to find so far lead me to believe that with fat wrung out of energy consumption in business and industry, as is being done, and with more efficient cars on the highways, as will be the case, each barrel of oil per day equivalent in energy consumption will, in the near future, be equivalent to at least one person employed. Thus, reducing our imports by a million barrels a day could, in the near future, mean the loss of a million jobs. This may be a pessimistic estimate, but there is enough substance to it that it introduces a new and compelling factor into our thinking.

There is a point beyond which further reduction in energy consumption will seriously impact the job market. Quite frankly, I am concerned about the stability of our society if energy supplies drop too quickly and too far below normal demand. Energy waste can and must be eliminated, but one man's conservation may all too frequently be another man's unemployment.

Thus, a national energy policy must allow a large segment of our people to continue to aspire to—and strive for—a higher standard of living, and greater freedom and dignity for all. This has always been the hallmark of American society and we cannot expect low- and modest-income Americans—or average American housewives—or those who want women to be liberated, to sacrifice such aspirations just because we suddenly don't produce enough energy to provide employment for our citizens, or because we have planned so poorly that all but the most affluent must cut back on their standard of living.

Certainly each of us recognizes that a sort of three-cornered dynamic equilibrium should exist between energy conversion, transmission, and consumption in one corner, a reasonable and rational program for protecting our environment and conserving our resources in the second, and the maintenance of a stable and responsive economic system in the third corner.

So, while we cannot afford the excesses which marked some industrial development of the past, raping our land and polluting the atmosphere, we cannot expect to have energy production without some impact on the environment, no matter how benign the source may seem to be from a distance; and we certainly cannot expect to have jobs for the American people unless we produce more energy. There-

fore, we have several "environments" to protect all at the same time. There are, for instance, those that we classically think of in terms of air and water, but there is also the environment of the job market, and an industrial capacity that will maintain this Nation's national security and standard of living. Finally, there is the environment of our own homes, where we must have enough energy for a decent standard of living. Our national energy policy must strike this dynamic balance in a rational manner.

This is one reason why the activities of Ralph Nader and his busy but essentially ignorant supporters present a more serious threat to our society than they do when working on such projects as ignition interlocks on seat belts. This Nation is truly in mortal danger. Our standard of living, our economic stability, our political institutions, and even the safety of our streets may well hang on whether or not we are able to produce enough energy to maintain the job market and an opportunity for low-income Americans and members of minority groups to aspire to and work for a decent standard of living.

If we are to produce enough energy, Mr. Chairman, we must, as the saying goes, "get organized", and we must base our policies and programs on scientific truths and sound management practices, adopting a systems approach to a comprehensive, integrated national energy policy.

America does not have the time to allow this to happen by accident. We must bring the spotlight of truth on this subject so that every responsible citizen can see and understand the facts.

Accordingly, I would like to present to you material which, I believe, can help us all understand the need for a National Energy Production Board, such as you propose in S. 740.

[The material referred to above follows:]

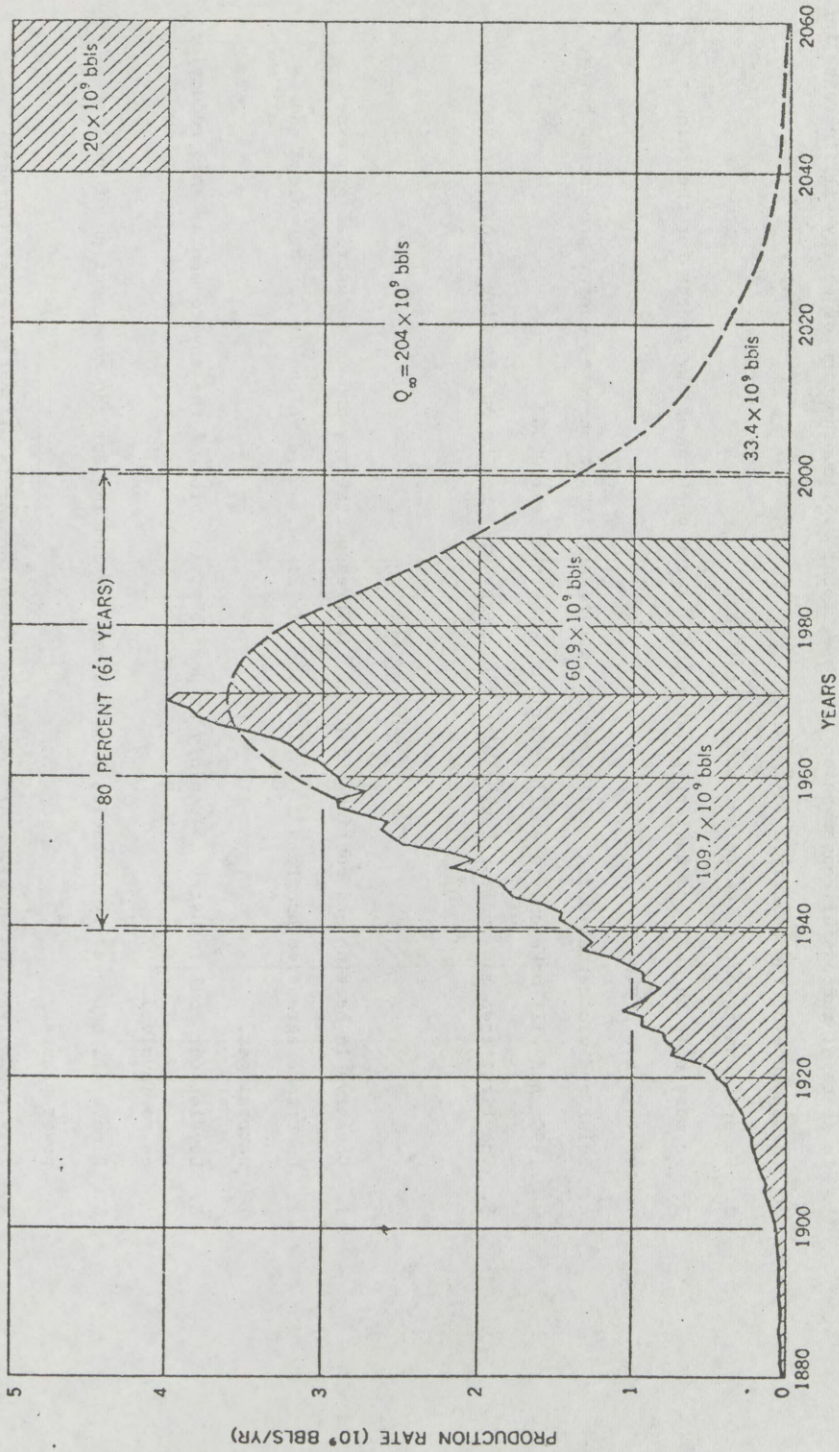


FIGURE 66. — Estimate as of 1972 of complete cycle of petroleum liquids production in the conterminous United States.

WHAT ARE THE LESSONS TO BE LEARNED?

1. In spite of successful conservation programs, total U.S. consumption of energy will increase for the balance of the century.
2. We are running out of petroleum and natural gas.
3. We must rely on coal and nuclear fission for a large portion of our energy for the balance of this century.
4. Solar and geothermal energy will have no significant impact on total energy production before 1990, and will make only a small contribution by the year 2000.
5. The first economic nuclear fusion electric energy will not be on the line before the year 2000.

WHAT WE MUST DO

1. Conserve in heating and cooling buildings, in transportation, and in industrial processes.
2. Undertake aggressive programs of exploration, drilling, and development for petroleum and natural gas.
3. Develop our coal industry as rapidly as possible, in spite of the environmental and production costs involved.
4. Remove all unnecessary obstacles from and provide funding for the construction of nuclear power plants.
5. Institute aggressive programs of research and development in all energy-related areas.

ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

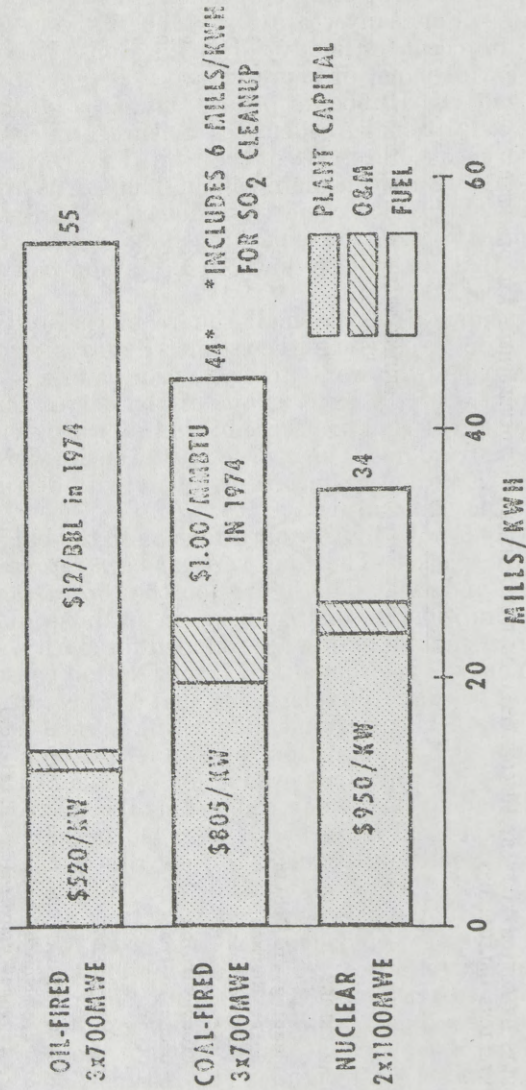
I. RESULTS OF ACTION TAKEN BY SUBCOMMITTEE ON ENERGY RESEARCH, DEVELOPMENT AND DEMONSTRATION
(\$ MILLIONS OBLIGATIONS)

	FISCAL YEAR 1975		FISCAL YEAR 1976	
	(Estimated)	ADMINISTRATION REQUEST	SUBCOMMITTEE INCREASE	TOTAL PROPOSED
SOLAR ENERGY	38	70.3	73.4	143.7
Heating and Cooling				
Solar Thermal		26.0	14.4	40.4
Photovoltaic		13.2	15.3	28.5
Wind		12.8	16.7	29.5
Bioconversion		11.5	6.6	18.1
Ocean Thermal		3.6	2.9	6.5
Other		3.2	8.0	11.2
Other		0.0	9.5	9.5
GEO THERMAL ENERGY	28	23	33	56
ENERGY CONSERVATION (transmission, storage, advanced transportation, end use, improved conversion efficiency)	25	41	94	135
MATERIALS RESEARCH & MOLECULAR SCIENCE	83	94	20	114
NON-NUCLEAR ENVIRONMENT & SAFETY	--	241.5	16	257.5
SCIENTIFIC & TECHNICAL TRAINING	--	--	5	5
TOTAL	--	469.8	241.4	711.2
II. ADDITIONAL RECOMMENDATION OF CONGRESSMAN MIKE MCCORMACK (\$ MILLIONS EXPENDITURES)				
FUSION (MAGNETIC CONFINEMENT)	105	144	48	192

Exhibit 1 COMPARATIVE POWER GENERATION COSTS

BASIS

- 1985 COMPLETION-AVERAGE COST FOR 1st 10 YEARS
- 15% FIXED CHARGE RATE AND 70% PLANT FACTOR
- 5% ESCALATION FOR FUEL AND O&M; 7.5% ESCALATION ON CAPITAL



From Converter Reactor Alternatives
by Ken Davis, Vice President of Bechtel Power Corp.

Congressman McCORMACK. I would like to direct your attention first to page 2 of the material before you. The curve you see has been prepared by Dr. King Hubbert, of the Department of the Interior. His studies over the last 20 years have proved to be remarkably accurate in the projecting how much recoverable oil there is in the United States. For many years, Dr. Hubbert's work was ignored or ridiculed, but in recent testimony before the House Ways and Means Committee, an entire panel of representatives of government and industry supported Dr. Hubbert's projections. In addition, a study on resources by the National Academy of Sciences indicates that the undiscovered recoverable oil reserve of the United States is about 113 billion barrels. Today, we are consuming about 6 billion barrels a year, about 4 billion barrels of which come from domestic sources. Thus, the curve before you shows that we are peaking at about 4 billion barrels per year today, and that we will be down to 1.5 billion barrels a year production in the year 2000.

Incidentally, the small square in the upper right-hand corner of the graph represents the estimated oil reserve of Alaska.

Anyone who wants to waste time can do so by quibbling over exact numbers of the exact shape of the curve. The message should be as clear as the common sense behind it: we are running out of petroleum and natural gas. This is true for the entire world, including the Middle East. Each nation has its own date with destiny, and few lie very far into the next century.

May I now direct your attention to the bar graphs on the first page of the packet. The four vertical bars represent 4 years—1972, 1975, 1985, and 2000. The figures on the top of each bar represent energy consumption in this country, in millions of barrels of oil per day equivalent. All figures are rounded for clarity.

You will see that in 1972, this Nation consumed 34 million barrels of oil per day equivalent, and that our projection for 1975 is 37 million barrels per day. Some interesting trends are immediately obvious. Domestic oil production is down one million barrels a day since 1972. Domestic natural gas production is down by the equivalent of one-half million barrels per day. Imported oil is up from 4.5 to 7 million barrels per day. Coal has scarcely changed in 3 years, increasing only from 6 to 6.5 million barrels of oil per day equivalent. Hydroelectricity is up from 1.4 to 1.5, and nuclear energy from 0.3 to its present 1 million barrels of oil per day equivalent.

I have projected energy consumption for this country for 1985 based on many reports and studies, including those I mentioned earlier. The projected consumption of 48 million barrels per day equivalent in 1985 assumes reducing energy consumption during the next 10 years by 6.5 million barrels a day below what it would be at traditional growth rates for the past decade. This assumes an extremely aggressive conservation program, saving essentially as much as we are now importing in petroleum.

Consumption of 48 million barrels of oil per day equivalent in 1985 also assumes a very aggressive exploration and drilling program for petroleum and natural gas. If successful, such a program can bring our declining production of domestic oil back up to the 10 million barrels per day level I show for 1985, and our natural gas up to 11

million barrels per day equivalent. Several representatives from the petroleum and gas industry, and several friends from Government or research foundations have critiqued those estimates. While there have been slight differences, the general consensus is that I may be too optimistic in projecting the combined total production of petroleum and natural gas for 1985.

This 1985 projection assumes increasing coal production from 6.5 to 10 million barrels per day equivalent. Most experts believe that, even with a "crash" program, coal production will not double between 1975 and 1985. Even the expansion I project means a far greater national commitment in money, manpower, materials and transportation than is generally understood today.

Increasing hydroelectric potential to 2 million barrels a day equivalent means getting virtually all sites that will be developed on the line and up to full capacity. The nuclear projection for 1985 assumes that the 221 plants now on the line, under construction, or on order will be completed and on the line within 10 years. It is interesting to observe that energy production from these nuclear plants is essentially equivalent to all the oil we import today.

Two points are most significant, however: the first is that with this all-out program of oil and gas exploration and drilling, of expansion of our coal industry, development of our hydrosites, and getting our nuclear power plants on the line, we must still import more oil than we are importing today. The second is that if we choose to arbitrarily reduce the 48 million barrels of oil a day equivalent for total consumption, we will be reducing employment in this country by, I project, a million jobs for each 1 million barrels.

The bar for the year 2000 represents the conclusion of a proposal made by the Council on Environmental Quality of the U.S. Government. Dr. Russell Peterson, the Chairman of the Council, calls it the "Half and Half Plan." He suggests that between now and the year 2000, we cut our traditional energy growth rate from 3.4 to 1.7 percent, conserving half and producing the other half in an environmentally and economically realistic manner.

You will observe that this is a Spartan proposal. Historic growth rates would have us at 87 million barrels of oil equivalent instead of the 58 we show. The projected growth rate from 1985 to the year 2000 would average only 1.3 percent.

The message in Dr. Peterson's projections is clear, whether we accept the exact figures he uses or not. Our domestic oil supply is rapidly declining, as is our supply of natural gas. Imported oil will certainly become more and more difficult to obtain. As is the case for the 1985 projections, several critics consider Dr. Peterson's figures for oil and gas to be optimistic.

Again, two major lessons are to be learned. First, solar and geothermal energy will make only a very small contribution to this Nation's needs, even by the year 2000. Second, and to repeat, this Nation must depend for most of its energy on coal and nuclear fission for the balance of this century. There is no choice if we are to preserve our Nation.

Page 3 shows what we must do. First, we must, of course, conserve in heating and cooling buildings, in transportation, and in industrial

processes of all sort. Second, we must undertake aggressive programs of exploration, drilling, and development for petroleum and natural gas. Third, we must develop our coal industry as rapidly as possible, in spite of the colossal environmental and production costs involved. Fourth, we must remove the unnecessary obstacles and provide funding for the construction of nuclear power plants. Fifth, we must institute aggressive programs of research and development in all energy-related areas.

Page 4 provides some information on what we are doing in nonfossil and nonfission energy research, development, and demonstration. These authorization requests for fiscal 1976 were recently completed by the subcommittee which I chair on the Science and Technology Committee. We have increased the authorization for solar energy from an estimated \$38 million for fiscal 1975 and an administration request of \$70.3 million, to a total of \$143.7 million.

By way of comparison, our solar energy expenditure for fiscal year 1973 was \$4 million.

The authorization for geothermal energy has been increased to \$56 million, up \$33 million from the administration request. In 1973, it was \$3.4 million.

Energy conservation has been increased from \$25 million for this fiscal year to a proposed \$135 million for fiscal year 1976. Nuclear fusion, which is authorized by the Joint Committee on Atomic Energy, is \$105 million for fiscal 1975. This almost doubled the expenditure for 1974, and my proposal of \$192 million for fiscal 1976 will, if accepted, almost double it again.

In addition, we must expand our programs for fossil fuels research, development, and demonstration and continue our programs in nuclear fission research, development, and demonstration, particularly for the breeder program, for health and safety, and for alternate reactor and breeder concepts.

I make these points, Mr. Chairman, to demonstrate my conviction that we must establish a systems approach to a comprehensive, integrated national energy policy. What I have just described is the ERDA portion, dealing with research, development, and demonstration, but what we need is a management program for production of every economically feasible and environmentally attractive type of energy conversion, transmission, and distribution. This is why I consider S. 740 to be so important, complementing what we have done in creating the Energy Research and Development Administration and the Nuclear Regulatory Commission.

Mr. Chairman, as a Member of Congress, I am fully aware of the work that the Senate Interior Committee and staff have done in recent years in helping to take the constructive steps that have been taken in dealing with this Nation's energy problems. As a citizen of this country, I am deeply grateful. In particular, I am grateful for the personal leadership you have given in this area that is so vitally important to our country. The time has now come for a new message from those of us who understand the nature of the energy crisis—a message to the Congress and to the rest of the country. This Nation must produce much more energy than it has in the past, drawing upon coal and nuclear fission as our supplies of petroleum and natural gas

are exhausted. The enactment of Senate bill 740 can make a significant contribution in responding to this most urgent of national needs.

The CHAIRMAN. Congressman McCormack, I want to commend you for a very fine statement. We on the Senate side are very grateful for your outstanding leadership in the House. I told my colleagues over here, we are very fortunate in having a scientist in the Congress.

Congressman McCormack's particular discipline for many years was chemistry. I don't know of anyone that is more familiar with the technical aspects of the energy program in its broadest sense, officially or nonofficially, than Congressman McCormack.

May I just ask one question?

I have been concerned about these estimates on recoverable oil. I don't think the studies which indicate 113 billion barrels are in the ball park; we get estimates up to 2 billion barrels. There is an element of speculation in it?

Congressman McCORMACK. Yes, there is. In the 200 billion barrel estimate by the U.S. Geological Survey, the assumption was made that oil production for a given oil field would be uniform across the entire field, and at the production level of the center of the field. This is not true, according to actual experience. If the USGS had used actual production profiles, their estimates would be close to the 113 billion barrel estimate reached by the National Academy of Sciences. The fact is we don't know for certain. We don't know, for instance, if there is any offshore oil north of Virginia.

The CHAIRMAN. What we need to do then is to find out and do the preliminary work?

Congressman McCORMACK. Yes, and this is one of the reasons your bill is so important. I think we also must have as our policy to plan for the worst, and hope for the best. This is why the policies should be based on the lowest estimates.

The CHAIRMAN. We appreciate your support of the basic concept of the bill. I stress that this is a working draft and the witnesses will have a lot to say, frankly, from my point of view, in determining the amendments and changes and additions that will be made. It is an effort to mobilize all our resources in an effort to get the production as soon as possible.

I want to thank my good friend for his able testimony.

Senator HANSEN. I am very pleased to join with you in welcoming a very distinguished Member of the other body here today. I have known Mr. McCormack for some time and share with you your high regard for him, not only as a legislator but as a scientist as well. I am very much interested in his testimony.

I am aware of the rather tight situation with respect to the next witness, so just let me hold my questions in abeyance and I will take them up with him later.

Congressman McCORMACK. I am available to talk with you at any time, of course.

Senator BARTLETT. I likewise welcome Mr. McCormack. We have had a number of discussions about our overall problems, so I am sorry I didn't hear your entire statement. I will look forward to reading it.

I would like to ask you one broad question.

In Senate bill 740, do you see any constrictions that might occur on the ability of private enterprise to function to the fullest extent by the provisions of 740? I am looking at it, perhaps, with a little concern about whether it might be constrictive.

Congressman McCORMACK. Not as I see it, Mr. Bartlett. I am aware of the fact that this is a working draft and much will be done, and much of what witnesses say will have an impact on it. I have been living with continual frustration with the fact that we have not been engaged in any sort of plan for energy production. As I see it, we have an unlimited demand for energy and we will never be able to catch up until before the end of the century. Thus, I see Federal involvement being helpful, the same as it was during World War II when the War Production Board acted to support industry so they got to do their job. I look at this in much the same way.

Senator BARTLETT. Do you look at our ability to produce sufficient energy as very crucial to employment, very crucial to the poorer groups in our society being extremely frustrated and not having achieved the anticipated standard of living?

Congressman McCORMACK. Yes, I do. I think it is one of the most important factors facing our Nation today. We are just coming to appreciate the direct relationship that the amount of energy we produce has to the number of jobs we have. Unless we have that energy, we are not going to have the jobs.

I am deeply concerned about the future of this Nation on that basis, even if we disregard all other factors. There is a point in our future energy production below which we are going to have serious problems with unemployment. This could result in major depression and political and social unrest. This may be more serious than anything we have experienced in the past.

Senator BARTLETT. In addition to jobs, do you agree that the poorer segments of our society have gained the most in the use of energy relatively in the last, probably two decades, at least in the last ten years; that the poorer segments of our society were anticipating a more rapid growth and those not having enough, those would be the areas probably most frustrated?

Congressman McCORMACK. Yes, this is true. There is no question about the fact that any attempt to hold down energy production per capita in this country is going to discriminate against minorities and low-income groups. It will certainly exacerbate the situation as to unemployment among the minorities and the youth. Any person who is deeply concerned about the minorities, unemployment, even liberating women, must be concerned about producing enough energy to do it.

Senator BARTLETT. So, in a nutshell, you are not subscribing to the "no energy growth" theory?

Congressman McCORMACK. Mr. Bartlett, I think the "no energy growth" is a formula for a catastrophe worse than losing the Second World War.

Senator BARTLETT. You put it very strongly; I agree with that. On that, I thank you very much; I find I am in agreement with you.

The CHAIRMAN. Thank you again, Congressman McCormack. We will look forward to our continuance of those programs that we are working on together. We know we have a top anchorman over in the House.

Thank you.

Our next witness is Michael Blumenthal, chairman of the board, president, chief executive officer of the Bendix Corp. Mr. Blumenthal has had a distinguished record in government. He was Assistant Secretary of State For Economic Affairs in 1961 and he was appointed the President's Deputy Special Representative for Trade Negotiations with the rank of Ambassador in 1963; he served as the U.S. Representative on the Commission of International Commodity Trade of the U.S. Economic Council in 1961 and 1968; he was Chairman of the U.S. delegation to the United Nations Coffee Conference in 1962; and he was vice president and director of Crown International Cork Corp. from 1957 until he entered the Government in 1961.

We are delighted to welcome you, Mr. Blumenthal, to the committee and we are most appreciative of your taking your time to come and look at this proposal and make your comments. I regret I will have to leave, as I indicated earlier. Senator Johnston will take over the chairmanship and he will conduct the balance of the committee hearing.

Mr. BLUMENTHAL. Thank you very much.

**STATEMENT OF W. MICHAEL BLUMENTHAL, PRESIDENT, THE
BENDIX CORP., BENDIX CENTER, SOUTHFIELD, MICH.**

Mr. BLUMENTHAL. Members of the committee, may I express my deep appreciation for your invitation to appear before this committee and to testify on this bill. I think it is one of the most important long-term issues that is before our Nation.

I have a prepared statement which I can read but, with your permission, Mr. Chairman, and in the interest of saving time, I could just summarize.

The CHAIRMAN. The entire statement will be included and you may proceed in your own way to cover the subject matter.

Mr. BLUMENTHAL. I thank you very much. I will just make a few remarks to summarize briefly what it is that I say in my statement. I should say at the outset that I am not here as an expert on energy but more as an interested citizen and former Government employee, as well as a businessman and someone who belongs to a number of organizations interested in public affairs in this regard.

I have a deep interest in the development of a sensible and sane public policy with regard to this whole energy matter. I would like to say I fully support the objectives of S. 740 which seeks to establish a national energy production board. I think this is an excellent idea and a much-needed initiative. I wish to congratulate you and your colleagues on this committee for taking the initiative to move forward on this matter.

As I pointed out in my statement, though, I do believe there are a number of areas in which the bill requires clarification. I was happy to hear you say a moment ago that you considered this to be a working draft rather than a finished development because it does have some ambiguities.

The CHAIRMAN. We were trying to get at least an outline of an effort that should be made and we will be relying on witnesses and other experts to come in and give their input so we can get a more comprehensive picture.

Mr. BLUMENTHAL. There are really four points, Mr. Chairman, that I would like to emphasize.

First, the fact is, if we are to attack this problem in the right way, it seems to me that we require a comprehensive national energy plan. I believe that planning should be done in a variety of ways. I think the energy area is a very excellent example of where an overall plan is very much needed. I think the bill in this regard, if anything, doesn't go far enough.

For example, it is not entirely clear whether the intention here is to deal only with energy from Federal lands or whether it is to cover everything as a whole. I would say a board of this type could develop a plan and implement it; that it has to look at our total energy picture, our resources and our problems within the country, not just those that are on Federal lands. So, the approach has to be comprehensive and the functions which are hinted at have to be spearheaded with an inventory of all our energy resources, be it oil, other fossil fuels, or other forms of energy.

Second, we need to work out how we are going to develop, convert, and transport these resources, price and allocate them and, of course, ensure a fair share of these resources going toward all the various needs in the country.

Third, I would like to address myself to the question of how the financial resources are to be marshaled and made available. There is little reference to that in the bill as it is now written. It seems to me that is a critical area that needs some attention.

Fourth, we need to pinpoint the role of the public and private sectors in this very mammoth enterprise and try to develop an approach that brings out the best potential of private industry and the public because both are important; one cannot do the job without the other.

Fifth, we must recognize and seek to overcome by specific recommendations to the Congress the conflicting jurisdictions between Federal, State, and local entities and the different pieces of legislation that are on the books today, so as to make a comprehensive effort to attack our energy problems.

My second point has to do with the Government's role in this effort. The bill appears to call for—again, it's not entirely clear—for direct involvement of the Government in drilling, exploration, production, and transportation in the various areas. I think it is important to try to make a distinction between what the Government should assure is being done or will be done and what the Government does itself.

I have some hesitation about putting Government directly into the energy business by doing all of these things I have mentioned. I don't think that is necessary. I think Congress has all of the resources available to it and all of the tools to ensure that it is done; and that, first of all, available private resources are marshaled. The tools include tax incentives, purchase guarantees, loans if necessary, and when you set out for bidding certain explorations you can have strict time limits. We have that in the lumber business, for example. If you have cutting rights, you have to perform within a certain period of time. There is no reason why that could not be done in the energy field.

You can devise certain types of profit-sharing plans to make sure profits are not exploited, particularly on Federal lands. There are various kinds of profit incentives to make sure we move forward. As

to needed equipment, it seems to me it is possible to take a variety of steps in order to stimulate the production of these. I would reserve the entry of the Government directly into the production of energy only as a last resort, only when it is clear that the private sector under the kinds of legislation and stimulation you have outlined cannot or will not do the job. I think the right to do so, of course, has to be there, but in terms of actual implementation, I would rely first on marshaling the private resources available.

My third point has to do with the bureaucratic problem, if you will, and the organizational problem. I have had some experience in the trade area of seeing what happens if the Congress adds one more agency or bureau to the panoply of agencies already in existence with their overlapping and sometimes conflicting responsibilities. As a result, there is more conflict, more bureaucratic infighting, and more confusion on the part of the public on where to turn to get a job done. I don't think we need another board that studies, coordinates, and recommends.

I think one of the previous witnesses pointed this out. I believe Mr. Woodstock said, in dealing with the oil problem over a year ago, there were something like 62 different agencies that had some kind of involvement with the problem. I haven't counted them today but there are quite a few.

It seems to me, as we move forward setting up a board that is to be a central organ for coordinating and giving impetus to this effort to inventory and develop our energy resources to meet our needs, that you should take a careful look at what functions are now existing in other agencies and departments that could be melded into the responsibility of this board. We should determine which could be eliminated and how we can simplify the structure rather than complicate it further.

There is, of course, the question of putting too much power in one body. But it seems to me that Congress has all the authority necessary to provide the proper safeguards and insure a national specific course of action. I think the question is to find the middle course between diffusing power within the executive so broadly that nothing gets done and centralizing so much that there is abuse.

My fourth point, in addition to the few questions I have at the end, really relates to a notion that I feel is not sufficiently addressed in my statement. I have some doubt whether 90 days to make out these proposals is practical. I don't know that it can be done in a proper way in that time. But it seems to me that the board should be required to present to the Congress a clear list of those existing laws, rules, and regulations that conflict with the overall objective of this bill—namely, the development of an energy plan and recommendations to the Congress for specific legislation to remove these obstacles.

As this bill is written now, the board is to do some of these things; on the other hand, it isn't allowed to get the indepth recommendations I would want to see made to the Congress. Unless we remove these obstacles, I don't believe we are going to get very far.

In conclusion, I think it is clear that everything in economic policy, both nationally and internationally, in a sense is related to everything else. We talk about unemployment. If we do that, we have to talk

about inflation and that leads us directly to energy. In my view, the high priority at the present moment is to get people back to work. It is jobs. That is an immediate and short-run problem.

The second priority is the problem of inflation. If I had to make a choice, although I recognize the difficulty, I would go for the jobs. Energy is related to the other two problems, but it is a problem that will be with us for a long time. There is nothing that can happen this year to solve the energy problem quickly. We can only set the stage for a long-run solution.

It seems to me that we should do this with due speed but we should not be hasty and obscure the fact that it is a long-run program and requires the marshaling of all of our resources based on very careful reflection.

I think the challenge is enormous. It is a fine testing of the mettle of this country.

I have no doubt—given our history and the fantastic things we have done, albeit during the war, in mobilizing and marshaling our efforts toward one goal—that we can succeed. With careful planning in the development of a comprehensive plan, we surely can succeed.

Thank you very much.

[The prepared statement of Mr. Blumenthal follows:]

STATEMENT OF W. MICHAEL BLUMENTHAL
BEFORE THE U.S. SENATE COMMITTEE ON
INTERIOR AND INSULAR AFFAIRS ON
THE NATIONAL ENERGY PRODUCTION BOARD ACT OF 1975

S. 740

APRIL 14, 1975

Mr. Chairman and members of the Committee:

In expressing my appreciation for the opportunity to appear before this Committee to testify on a matter of great national importance, I quickly want to disavow any special expertise in energy matters. Moreover, I hope it is understood that The Bendix Corporation has no direct interests in the production or distribution of energy but for one small subsidiary that does geophysical exploration for petroleum for others under contract arrangements.

My appearance is in the role of a concerned citizen, as a former government official who was extensively exposed to the workings of government, as a business executive, and as a member of many organizations, both domestic and international, whose main concerns are with public policies.

Many of us are concerned that our government has failed to develop a comprehensive national energy plan behind which a consensus could be formed. In S. 740, a bill to establish a National Energy Production Board, there is the potential for the creation of such a plan. I therefore support this bill, but with the strengthening and changes that I will recommend. There are four main points about the bill to which my remarks will be addressed.

First, the bill should require the NEPB to prepare a comprehensive national energy plan. As the bill can now be read, it seems to provide planning only with respect to energy sources located on federal lands.

Second, the bill appears to foresee the government entering directly into exploration, production and transportation of energy sources, as well as into the production of materials necessary thereto.

To be sure, the NEPB should have the responsibility and power within the overall plan to assure that these matters are executed in a way which assures that national needs are served. But this should not lead to the creation of many government-run businesses. In most matters, the private sector can do the job. The government's role is to motivate it, to assure that it performs in a way that serves the public interest. The government should run energy businesses only when there is no promise that the private sector will do so in a matter that serves the national interest.

Third, I wish to raise what I consider to be a critical organizational matter which may well determine the success of the NEPB. The somewhat ambiguous powers and responsibilities of the NEPB offers the danger that it will become but one more agency merely coordinating rather than acting. We are already replete with bodies concerned with energy. Responsibilities among them are confused, duplicating, and sometimes conflicting. Bureaucratic rivalry sometimes outsteps reason and cooperation. Hopefully, the powers and responsibilities of the NEPB will be made so clear that the number of agencies can be reduced, procedures be simplified, and it will become clear that the NEPB is the principal place where policy is made and decisive action is taken.

Fourth, there appear to be a number of ambiguities in the bill which could dilute its purposes and the powers of the NEPB and sow the seeds for later confusion. If a few of them are pointed out, they may lead to an improved bill.

Before discussing each of these points in somewhat greater detail, I would like to offer one more observation. Energy is an extraordinarily complex matter affecting our society. Precisely for this reason, we require a comprehensive plan for attacking it. It requires an intense and cooperative effort by private and public interests, by various levels of government, and by many diverse elements of our society. Our political processes must bring all these into harmony. And if they fail to do so, we must have grave reservations about our ability to handle still other complex matters that are bound to affect us in the years ahead. Since we have the skills, the capital, and the national resources to mount an effective attack upon energy, it would be extraordinarily damaging for our country if we failed to do so. S. 740 could represent an important step toward success.

Now, I would like to elaborate on each of these four main points mentioned before.

It is not entirely clear to me whether the bill is supposed to lead to a comprehensive national energy plan or only to a plan dealing principally with federal lands and to other matters such as transportation and materials problems.

Comprehensive national planning is increasingly needed to meet our complex problems. For this reason, together with many leading business, public, and academic leaders, I have endorsed the Proposal for a National Economic Planning System sponsored by the Initiative Committee for National Economic Planning.

The energy area is clearly one in which this type of national planning is virtually indispensable.

We need a comprehensive plan for exploration and development of all energy sources; for their conversion and transportation; for judging the uses to which energy is put and for its allocation when necessary; for pricing policies suited to the costs of development and to a fair sharing thereof by users; and for an equitable sharing between the public and private sectors of the rewards from the development of federally-owned resources.

We need to understand on a national scale the extent of the need to mobilize our resources and to identify the physical obstacles thereto and the specific remedies therefor.

We need to know whether our financial markets are capable of financing both private and public development and the extent to which new financial institutions need to be created or old ones adapted to new realities.

We must clearly pin-point the capabilities of the private and public sectors and establish their roles in ways which minimize duplication and optimize the chances for rapid progress.

We must have a plan for reconciling the problem raised by conflicting political jurisdictions -- federal, state, and local -- that are legitimately concerned with energy. Various jurisdictions are affected by deep water ports, locations of refineries, coastal zones management, environmental, and related matters.

Only by adopting this comprehensive approach are we able to face up to the hard choices before us in developing relative independence in energy in the knowledge of the price to be paid for this.

Above all, we need a plan that is flexible, for the energy problem may unfold in a manner quite unforeseen today -- perhaps more or less severe than now believed.

To summarize then, the bill should be clarified to assure that it leads to an overall national plan and that this is one of the principal purposes in creating the NEPB.

The second matter that needs clarification relates to the intentions regarding the government's role in achieving the purposes of the bill. It can be read as directing the active participation of existing agencies and new government business is to be created in exploring for, producing and storing energy resources, in transportation, and in the production of

needed materials such as offshore oil rigs. I urge caution in these matters. A distinction should clearly be drawn between what the government should assure is done in the national interest and who does it. The government's main role is to establish a sound information base; to help define the task -- the overall plan; to monitor the execution of the plan -- are national purposes being met? -- and to assure that energy supplies are made available in manner rewarding to producers, while remaining fairly priced and equitably accessible to consumers.

Before creating many government businesses to assure achievement of these needs, the NEPB should take advantage of the great skills which exist in the private sector. There are many ways to obtain the services of private industry for the laudable purposes of the bill while still protecting the public interest. There are many firms that can explore for oil, drill for wells, transport crude, convert it and distribute it. Contracts can be let for private services with adequate safeguards for the public interest; if production of critical materials such as rigs and pipe needs encouragement, let us use tax incentives, government loans (if private funds are not available), purchase guarantees, allocation techniques, and other measures to encourage the movement of resources into the needed areas.

Let us not foster still more government agencies so long as there is a reasonable chance that the energies of the private sector can be mustered to do the job. Where it fails, the government should step in -- but not until then.

To summarize then, the bill should not encourage the entry of the government into the operational aspects of creating, transforming, and transporting energy. It should make clear that the NEPB should rely mainly on the private sector to assure that all this is done. However, the government should reserve to itself the right to act where it would appear that the private sector will fail to perform in the manner called for in the national energy plan.

The third point is perhaps the most important of all. I am concerned that the bill's provisions are sufficiently imprecise as to raise the threat that the NEPB will become but one more of an already excessively large number of agencies concerned with energy. We have too many already. Their efforts sometimes conflict, cause delays, and create confusion. If all the NEPB is to do is to coordinate and recommend, if it is not to possess powers that will permit it to cut procedural delays, and reconcile conflicting interests, then it may do more harm than good.

Merely to add one more bureaucratic entity that cannot act but merely advise and that cannot override but merely oversee, will retard rather than advance the cause. In creating the NEPB, we better also face up to the elimination of existing agencies and staffs that have proliferated in the name of energy and whose role should be absorbed by the new Board. We have a great opportunity here to do some bureaucratic pruning. Hopefully, all this could lead to the end of some agencies, absorbing staff of other agencies, and bring about something near to the "one-stop" agency that Secretary Fowler mentioned in his appearance.

Of course, there are real obstacles in the way of granting the NEPB the necessary stature to become the focal point for policy and action. There are laws, agency practices, and a host of delicately balanced relations among federal, state, and local jurisdictions that affect energy. Many interests collide. For this very reason, the bill should require the NEPB to do the following:

- Identify provisions of law, standards, and institutional arrangements and procedures that are now in conflict: where energy and environmental considerations collide; where the concerns of various levels of government part ways; where entrenched bureaucratic procedures and viewpoints run athwart current needs as in regulatory matters concerning the fair price to be paid for energy and in transportation matters.
- Recommend to the Congress and the President specific changes in laws or procedures to remove the conflicts that exist.

Once the NEPB has made its recommendations to the Legislative and Executive branches of government, the responsibility will rest there for reconciling conflicts in law, practice, and institutions that impede the attack upon energy. A reassessment of values can then be undertaken. What the Congress and the Executive have created, they can change. The NEPB can help to make clear the hard choices before us and to precipitate a reexamination of the many conflicting values that stand in the way of progress on energy.

And now I'd like to turn to my final point. There is need for greater clarity in some provisions of the bill. For example:

- Section 3 (b), "Purpose", speaks of federal involvement to supplement private sector efforts in increasing domestic energy supply and in improving transportation systems. Would these supplemental efforts be confined to federal lands as the bill might be read? Obviously, that would make no sense as regards transportation. Why should they not extend as well to energy sources wherever located -- on either private or public lands?

- In Title III, Sections 301, 302, and 303 call for the submission of detailed action programs to the congress within 90 days of the passage of legislation. This is most probably unrealistic. The quality of recommendation of this plan would be bound to suffer. While our needs call for action, undue haste will not serve us well. I suggest that this 90-day provision be reexamined.
- Section 303 relating to facilities. Why, if there is a shortage of, say, rigs, would we be interested in assisting their production only in federal facilities? Why shouldn't the powers of the NEPB extend to assisting rig production in both public and private facilities? This exemplifies my earlier point that the bill is too limited -- or at least ambiguous -- as to what it intends to achieve.
- Section 304, "Expediting Government Action." There are several ambiguities. First, Section (b) says that the NEPB should propose procedures to other instrumentalities of government to break through procedural and institutional impediments but it may not recommend any action contravening existing laws. But Section (c) says that such contravening recommendations can be made provided that it is in accordance with Paragraph 3 but only if that does not involve a deviation from standards relating to public health, safety, and the environment; and further provided the NEPB's recommendation for a given project does not modify approvals for future projects. After this comes the expedited procedure report to the Congress and if neither House disapproves, the procedure becomes law but only for this one project.

This hardly suggests expeditious action. Should the NEPB not step up to the issues? Should it not be instructed to recommend to the Congress measures to reduce the incompatibility of provisions of law and institutional procedures instead of ducking them? Why must its action necessarily be case-by-case? If there is a generic problem, why not treat it that way?

Mr. Chairman, I cannot pretend to understand fully all the provisions of the bill. The criticisms may be in error and, possibly, have overlooked matters more serious than those already mentioned. It remains my impression, nonetheless, that the bill needs redrafting to make its intention unambiguous and in several cases to assure that problems are squarely addressed rather than being gingerly stepped by.

Mr. Chairman, I would like to close as I began with a strong endorsement of the basic purposes of the bill. Some changes, however, are needed. Above all, the NEPB should be required to prepare a comprehensive national energy plan and be equipped with powers to see it executed. I would also encourage you to make explicit that the NEPB's responsibilities go beyond that of primary concern for federal lands. With these changes the bill should become law.

Once again, permit me to commend the Committee for its initiative in this matter.

The CHAIRMAN. I want to thank you, Mr. Blumenthal, for a very helpful statement. You have given some objective observations that can't help but be useful.

We are trying to do precisely, I think, what you have in mind; that is, to marshal all our resources in order to achieve proper goals and objectives that are achievable with a greater effort than ever before. As I view it, it involves the marshaling of all resources; private, Federal, local, non-Federal, and the whole area that should be involved. It is obvious we don't have that sense of urgency at the present time in terms of the expression of a plan that can achieve these essential objectives. I would agree with you that it is a long-term effort. I would like to have you comment on this.

If we really get a program in the broadest sense of the word and an all-out marshaling of resources moving; in other words, that America is determined to develop its resources so as to achieve less dependence on outside conventional resources of oil and natural gas, et cetera, that it is bound to have some impact on the price structure as it pertains to the cartel.

Would you comment on the very fact that we are moving and not talking about it, actually moving forward, even though we are not going to get the oil and gas we need for a period of time?

Mr. BLUMENTHAL. I believe that is absolutely true. Based on my experience during a part of the period I was in the Government when I had some participation in the development of commodity policies, I developed a deep and abiding skepticism about the ability of producers' or consumers' cartels to survive for all time. I think history is very clear on this point. I have no doubt that in time this cartel will not survive either.

The CHAIRMAN. It is certainly better financed than any we have ever had before.

Mr. BLUMENTHAL. Yes, there is more money and money has always been one of the factors that causes the decay. But conflict remains, and in time, I think, that will become more apparent.

Second, I don't think the stated objective of the energy program for the United States should be the destruction of the cartel. It should be what we want for our own interests and for the development of our own economy and for the welfare of our own citizens. I think, as we move forward intelligently in developing our resources, we will, as a byproduct, bring about at least a softening of the price structure and some modification of the price policies of the oil-exporting countries. This would be a natural consequence. But I think we should develop our policies more for our own sake and do it without the first objective being to break up the OPEC cartel.

The CHAIRMAN. I agree with that and our objective is to develop our own resources. I had in mind the cartel effort. I have to leave now. I again indicate to you my deep appreciation for your appearance before this committee.

Senator Johnston will now take over.

Senator JOHNSTON [presiding]. You have indicated you are not an expert but I must say from your statement it is one of the more extensive agreements we have had. Of course, that may be because I agree with what you are saying. You gave a very interesting presentation.

Mr. Fowler, in comparing the needs of the present time with the war effort, said we ought to consider something like a War Production Board which could do a number of things. It could enforce and set the policies and plans; on this we agree. You make the point very well; we don't have a Federal energy policy and we ought to have one. We are agreed on that. A War Production Board could do that with respect to the war effort. It had allocation powers, it had capital powers which by whatever means it could grant guarantees, loans, direct grants, and so forth; it could cut through delays. You wouldn't have all the public hearings and all that if the board could just say, "Do it", and it was done.

Is the energy problem sufficiently serious for us to consider giving a board such powers?

Mr. BLUMENTHAL. I think the energy problem is clearly one of fundamental problems that will be with us for quite a few years to come. I think any kind of solution of it over a period of time requires comprehensive planning and powers to make sure that we can execute the plan once the Congress has agreed this is the way we ought to go. Those powers are going to have to be fairly extensive. However, I should say that I think Secretary Fowler has directed his opinions from personal contact and experience with the War Production Board and I have not had that and he obviously is more knowledgeable than I would be.

I would just suggest, however, that we are not in a war. We are not in a national emergency of a kind that is implied by wartime situations. While it is clear that the goal of developing our energy resources for the future is not as direct and clearly pinpointed as a wartime goal which is victory, I think that given the realities of the political scene and of the various factors in which the public is interested in a peacetime situation you are going to have to make some distinction between a War Production Board and an energy board of this kind.

Senator JOHNSTON. In other words, I am asking if we could give the board the power to cut through the redtape and come up with a policy that we need to drill on the Atlantic seaboard; we couldn't give a board that kind of power?

Mr. BLUMENTHAL. That would be going a little far. But, it seems to me, having developed a program that involved drilling in a certain area, there should be a mechanism whereby legislation is provided, perhaps some kind of a global legislation—you wouldn't want a separate act for each rig, that authorizes a particular course of action rather than giving dictatorial powers, if you will, to the board without reference to the Congress and to other considerations just to make these determinations.

Senator JOHNSTON. Section 202(a) authorizes the board to prepare and carry out a Federal oil and gas exploration program. Do you think that is a good idea?

Mr. BLUMENTHAL. As I indicated in my prepared statement and in my comments, Senator, I think the objective of the board really has to deal both with the development of a program for energy resources from federally owned land such as this particular example as well as bringing the private resources into the planning process. To lay out such a program is a good idea. I would make a distinction, however, between causing this to be done and the board doing it on its own.

Senator JOHNSTON. You say the private sector should do it because it is not necessary for the Government to do it? Well, granted it is not necessary for the Government to do it, is there anything wrong with the Government doing it and, if so, why not?

Mr. BLUMENTHAL. I think these resources are available within the country at large, and not only within the large oil companies. There are quite a few independent companies providing geophysical exploration services.

I should say, I am not an expert in energy by any means and my company has no interest in the energy business other than to use energy. The only connection we have is a small subsidiary, the United Geophysical Corp., which indeed does some exploration work.

Some of these resources could be employed on a contractual basis. If the Government wanted to expand these, it is not too difficult, with the proper incentives, to cause new firms to enter the field and provide these services to the Government.

I think that is a better way of going about it. As with the Government, if the proper safeguards are built in, you are going to get quicker and more efficient action than if you put the Government in charge.

Senator JOHNSTON. If you would look at how the TVA was administered, then you can compare how private firms would do in comparison to that. Is that or is that not a valid argument to creating a Federal oil and gas corporation?

Mr. BLUMENTHAL. If you have no better reason than a yardstick argument to put the Government in charge, I have some doubts. The Government in many fields has developed plenty of experience and, I would say, a considerable degree of sophistication in looking over the shoulder of private contractors. My company in the aerospace field does a considerable amount of business for the Government. We have a great many Government inspectors and auditors in our plants. The Government is able, and indeed does, compare our performance very carefully to that of our competitors. It seems it is a positive way to get a good measure in this way.

There would have to be other reasons before I would say that the Government ought to set up its own capabilities just to be able to compare.

Senator JOHNSTON. How about the argument that we ought to have Federal exploration and not production? It is hard to define but, they say we ought to have Federal exploration so we know what is out there and how to lease it. What is your opinion?

Mr. BLUMENTHAL. As I understand it, the way Geophysical Services are being contracted it can be entirely on a proprietary basis. In other words, I don't think there is any reason why the Government cannot let out for bid a particular job for geophysical exploration on Federal lands and require that information proprietary to it be given to the Government so that the Government can then decide whatever it wishes to do with the information that it receives.

Indeed, it can have inspectors right there. Certainly, if there were independent contractors, their jobs would be simply to do the job for the Government and provide the information the Government wants. I don't see any reason why the Government should employ its own staff to do this job. There is no way in which a contractor could develop

information, valuable information, and then withhold it from the Government.

Senator JOHNSTON. Secretary Fowler made several comments in the first report released by the Atlantic Council on Energy, released in January of this year. He feels that Washington needs an organization of the Federal Government capable of assuming control of the necessary energy to take care of national needs. I understand you are active in that council. Would you comment on that recommendation? I think your previous answer probably covered it; however, do you have anything additional to add to that?

Mr. BLUMENTHAL. You are right. I am one of the directors of the council. I did not participate directly in the production of that document. But I think it is a good one. As I listen to your recital, I subscribe to it. I think the only point at which I draw the line—the only distinction that I would make, and I am not sure it stands in any conflict—is that I believe the Government should be assured that things are done. I believe the Government has all of the authority to see that things are done. I believe it should have the power to enter into action directly and on its own in cases in which it is shown that private interests cannot be made to act in accordance with the public interest.

In conclusion, I have no doubt it is possible for the Government to cause the private sector to do exactly what it wants it to do. Secretary Fowler's statement, as I heard you make reference to it, accords exactly with what my views are for facilities like this board with the necessary powers to develop and plan and to be sure of implementation.

Senator JOHNSTON. I am inclined to agree that the American people may not be ready politically for such a board with such powers to cut through some of the red tape. One person's red tape is another person's protection. I am not satisfied that we are sufficiently concerned about the problem. We like to talk about it but I don't know that we are sufficiently concerned to give anybody that kind of power. I think you really have to give that kind of power, if you are going to expedite action.

Mr. BLUMENTHAL. May I just add, I think we can go pretty far in the Congress in talking to people in a wide spectrum throughout the United States, be they businessmen no matter how conservative, when it comes to the kind of role they want the Government to play.

I think there is an overriding concern when we talk about energy, but we have done rather little about it. We haven't developed a policy that is clear and specifically defined and we are not moving on to implementing it. I think that is a clear view that is seen by quite a large number of people.

It seems to me that the Congress has a tremendous opportunity to capitalize on these feelings which are fairly widespread. We need a certain amount of education to get the message around to demonstrate that to implement this goal of moving forward with an energy program requires pretty serious powers. I would stop somewhat short of some of Secretary Fowler's comments, but I would encourage the Congress to go pretty far in this or we won't get much done.

Senator JOHNSTON. Thank you.

Senator BARTLETT. Thank you, Mr. Blumenthal. Would you be of the opinion that the responsibility for a consensus on energy policy lies with the Congress and the administration or with a board such as this energy production board which this bill would create?

Mr. BLUMENTHAL. Well, Senator, I think it is quite clear in my mind that the responsibility for developing a consensus which leads to specific legislation and a specific course of action sits squarely with the Congress and the executive branch. That is very clear. A board, either of this kind or in some other form, as I see it, with the manifestation of a judgment decision that has been made by the executive and Congress to move in a certain way. Now having created such a board, it is possible to envisage it indeed as S. 740 envisions it, that the board is to make certain inquiries and studies and gain certain background information. Further action then has to be taken by the Congress.

With recognition of the consensus here, the board can help you do the job and help prepare the background for it.

Senator BARTLETT. Do you see the responsibility of the consensus, regardless of what the board would recommend along with other recommendations that Congress and the executive branch have, do you see the prime responsibility with Congress and with the executive branch?

Mr. BLUMENTHAL. Absolutely.

Senator BARTLETT. Would you see at this stage, just looking back over the last several years and seeing very little progress in adopting an energy policy, do you see this board as far as energy policy is concerned, being an essential ingredient of a consensus, or could it in a sense be passing the buck at this point?

Mr. BLUMENTHAL. Well, I think, Senator, if the bill would call for nothing more than study and coordination, that one would have a valid argument in saying we are passing the buck. If, however, the bill is developed from this working document into a piece of legislation that provides authority for such a board to do more than that, to really pull together the various activities of the Federal Government in the energy area, to develop specific legislation for the Congress in the areas where there are present barriers to the implementation of a plan, to develop a plan with a comprehensive program and to be charged with the execution of that plan, then I think it is not passing the buck but it is the Congress taking a very clear and essential, vital step forward in solving our energy problems.

Senator BARTLETT. Well, in making that statement, are you or are you not talking about the kind of board that you would like to have, not necessarily the kind of board that would be created by this bill as it is now written?

Mr. BLUMENTHAL. I am talking, I suppose, about the board I would like to have and about how I would like to see the bill amended in the ways I have suggested in my statement.

Senator BARTLETT. As I understand it, as a very basic premise, you felt that entry of the Government should be on a last resort basis. To be more specific, what areas would you want to see the Government enter on any basis during peacetime? I assume you want them as a referee for competition as it is today, to prevent bottlenecks, instill

requirements, for instance, and so forth. Beyond that, where do you envision the Government being important to business; where would it enter business? Where it is inefficient or not allowed to move?

Mr. BLUMENTHAL. I see the Government as the agency which, in the first place, determines what is to be done. We can't leave that to the large oil companies or coal companies or private industry or any sector of private industry.

Senator BARTLETT. What do you mean by "what is to be done"? Are we to develop the resources on the Federal lands? What is the price policy going to be; are we going to have a minimum price for certain items, going to provide subsidies in order that those resources can be made economically more explorable? How much energy are we going to produce; how much money are we going to invest in non-fossil types of fuel that will be important to the future?

Mr. BLUMENTHAL. It seems to me this is the sort of thing that the Government has to determine in broad terms and set the tone for.

Second, it seems to me, the Government has to take on the responsibility for removing the impediments for the execution of this kind of general policy that it has set. For example, if there is a shortage of oil rigs, drilling rigs, drill platforms for offshore drilling, and if the economy is such that it is unlikely they are going to be available in the quantities and in the places in which it is necessary for them to be, it seems to me the Government has a role to play in developing the kinds of policy incentives to make sure this production takes place.

Third, it seems to me that the Government has to be the controlling agent to make sure there are not undue or excessive profits, especially in energy resources from Federal lands. Obviously, in the area of competition, no collusion can be allowed. The national interest must be served rather than an individual one.

Finally, I think the Government has to stand ready as a last resort to enter directly, if the tools necessary for the production do not seem to be sufficient to bring about the results intended.

Senator BARTLETT. Do you see the possibility of Government, as it is now, controlling the energy industry, or as it might be under the bill, being so restrictive on industry that it prevents it from fulfilling its capability?

Mr. BLUMENTHAL. I think that possibility exists, but I would hope that it is not a probability; perhaps only a theoretical possibility. I think the whole objective of this effort is to stimulate and develop the exploration of resources rather than their restriction. There are plenty of available people, either in the executive branch or on the Hill, who could devise methods of stimulation and not restriction.

Senator BARTLETT. Mr. Blumenthal, it seems to me from the time I have been on this committee, which is almost 2 years, and from the testimony I have heard, that the prime answers to the prime questions are that energy will be sufficient up until the end of this century; this is known. We have been told we need simply a package of decontrols on oil, a deregulation of new gas and, you also mentioned, the excessive profits and then some kind of windfall profits tax would apply, but not penalize the operations of an oil company which is putting all its money back into the ground. To this, there is the further recognition that any too large a profit that still might be made could be taken away

from the companies by Congress. Some say that would be a big step in the right direction; do you agree?

Mr. BLUMENTHAL. Senator, I started with a demurrer at the outset. I am not an expert in the energy field. I recognize that the Senators on this committee are. So, when you get into the details of specific steps, I defer happily to your individual and collective judgment. Certainly, from listening to it, it sounds like a reasonable approach. I think the main point I am making is an organizational one, leaving aside the specific measures that appear to be indicated; that is, a board like that can take all the known factors, pull them together, and present a coherent set of recommendations to the Congress to enable us to move forward.

If we have a central focus of this kind, through this board, and this board is able to take these known factors and go back to the Congress and say, "You have given us the authority to move forward; here is the plan which is composed of these known factors; now give us the further tools to do the job," then I think we are organizationally on the right track to move forward.

Senator BARTLETT. I think the questions asked don't require the expertise, perhaps, you might have read into them. I think it is based on a simple premise that with decontrolled prices there would be a maximization of the effect on the marketplace on the effort that is going to take place. If that takes place, there is certainly a better chance for achieving energy sufficiency or achieving a greater efficiency in domestic energy. I think you agree with that. I know it is a matter of priority.

My concern is whether we are going to get this or not. Others are concerned about the fact that we certainly don't want the profits to be high. It doesn't make sense to me, though, to be concerned about the profits that we follow a pattern that will assure ourselves failure. Doesn't it make sense to adopt a policy of maximizing the effects in the marketplace, then, if there are obviously too high profits then there is still the opportunity after the fact of taking care of it on a year-to-year basis by the Congress.

Shouldn't we emphasize a system that is going to work and then know that we will have another system that will work in eliminating excessive profits?

Mr. BLUMENTHAL. Obviously, I am most willing to agree with you that price controls of any kind should be avoided wherever possible. I recognize that phase 1 of the price control program was essential, but as we moved on to two and three and four, I, along with others, was fairly strong in feeling that we were doing more harm than good. We could decontrol or achieve our goals. We not only wish to have the stimulation for the development of our resources, but we want to be sure the consumer has access to these sources of energy as the burden of development is distributed.

It could be done through a variety of techniques. We would have to achieve various goals and still bring about a good energy policy.

Mr. BLUMENTHAL. I think there is a substantial difference. I think in this case the analogy is faulty in some respects. In the case of the space program, we were embarking on something that had never been done before and we weren't sure if it would succeed, if we had the

technology and the resources to succeed. Here, in this case, you are quite right, we know we can succeed; it is only a question of how much we are willing to pay, how much harder we are willing to try and what priority we want to assign to this effort. I think it is a real challenge. There is no doubt that it can be done. To that extent, I think it is different.

When President Kennedy said, "In 1971, we are going to be on the Moon," he was expressing a hope and maybe even an expectation but not a certainty. In this case, we can speak with certainty of the fact that we can develop our energy resources and have such a program. It is only a question of whether we will do it now.

Senator BARTLETT. Thank you very much for your fine answer.

Senator HANSEN. Mr. Blumenthal, I am not in a very good position to discuss this because I haven't studied it. Last year we set up ERTA which was meant to do research at various levels with various private involvement which depended on the nature of the energy source.

Theoretically, the show is on the road as far as developing new energy resources. From my perspective, what we have basically is an informational gap in this country. We do have various bits of information scattered around the Government on research on profit levels, on what particular energy form energizes what particular industry.

So, my feeling is that we don't have it centralized; companies fight like steers, giving out what they consider to be confidential information. I don't see how it could be confidential since their competitors know it themselves.

From my perspective we don't need an overall big stick; we need information. As far as protecting the Government interest in public plans, I think the Department of the Interior, if given more authority, could develop more information. I personally happen to share your particular prejudice in getting the Government into the drilling business; I think that is a mistake.

We should have more information for prospects on bidding. Do we really need these yardsticks; companies have some reservations about competing within certain areas? My further question is, if we beefed up our power so that we could adequately do seismic work for evaluation, would we need this?

Mr. BLUMENTHAL. I think that is an excellent question and it goes to the heart of this bill. I think we do.

Senator BARTLETT. Why?

Mr. BLUMENTHAL. Because, in the first place, in spite of the attention focused on energy problems over the last year or 18 months the existing agencies and legislation seem to have been insufficient to lead us to a comprehensive national program for the development of our resources. That would be a first essential step toward greater independence from imports and toward better assurance of the development of our own industrial base for the future. I think the development of an information base is clearly, as you indicated, the first requirement. But, I think it has to go further than that; even when we have developed that base we are going to be faced with very difficult questions of priority and questions of conflicting jurisdictions and interests. There has to be some place within the Executive under a congressional mandate, that brings out in the open what those con-

flicts are and we have to suggest to the Congress ways and means of resolving them and setting these national priorities. Previous witnesses have said that, and I subscribe to it.

We have many stopping places, many agencies and bureaus and departments in some way or other involved with this question. My own experience in Washington is that the difficulty in decisionmaking with regard to forward motion varies directly with the number of agencies that have some piece of the action. Unless you clarify that and say, "You are responsible; we need a policy and you are responsible for putting it together and for seeing that it is done", you are going to have interagency fighting among the different people trying to protect their turf and we will still be arguing 5 years from now.

Senator BARTLETT. Let me accept your answer as an accurate assessment of the job. Let us assume that this is the function of this agency. I can see having one group of people thinking on the problem. Now, do you think that it is right to vest in this Board, not only the recommendations of policy but the immediate implementation without further consultation with the Congress?

Mr. BLUMENTHAL. My recommendation would be to not vest this Board with the authority to immediately implement, but rather pull together the information base and develop the appropriate programs and proposals necessary to implement it; then go back to the Congress for specific authority. Then you would have the automatic check built into the program so Congress always has review. I wouldn't want to make them czars and give them a blanket mandate of doing whatever they think is right.

Senator BARTLETT. I appreciate your remarks. There are some of us, I think, that feel the Federal Reserve System has that blanket mandate.

Thank you.

I would like to join with Senator Johnston; I think your testimony was excellent and I appreciate it.

Senator HANSEN. Mr. Blumenthal, I was very impressed with your statement. I was sorry that I had to leave for a short while.

I confess, as was pointed out by the Senator from Colorado, I have not read the bill either, but just the preamble of it which is to promote the general welfare by establishing a National Energy Production Board to insure early development of energy resources on the public domain and on other Federal lands and on the Outer Continental Shelf in order to lessen the dependence of the United States on foreign nations for energy supplies which are essential to our national security, commerce, and a full-employment economy.

I agree with what seems to be implicit in that statement that we do want to get on with the early development of energy resources, but I am not certain this is the best way that we can achieve that objective. As I recall, some of the legislation that we have passed in the last year or two, I must observe that in my judgment some of the laws have been counterproductive of the early achievement of these goals.

I am from the State of Wyoming and because of the changes in the tax laws that were brought about just last March in the tax reduction bill, there now seem to be indications that there is plenty of equipment to drill new wells; there isn't a shortage of drill pipe in many places,

there is no shortage of drilling rigs—not that they came into being just overnight, but rather the demand that was established throughout the country before the passage of that bill seems now to have lessened and, as a consequence, there aren't as many people nor as much money in the market trying to rent drill rigs and trying to buy tubular goods, and all the things necessary to prospect for oil and gas.

I think the same thing seems to have been manifested and is moving in the wrong direction in other areas.

Do you believe that the free enterprise system is able, given the problems we have today and the concerns that have been spelled out in this title here and voiced publicly in the press, do you believe we are able to meet the challenge?

Mr. BLUMENTHAL. Senator, I do believe the free enterprise system is capable of doing that. In the complex environment in which we live, the private sector has to be seen as interacting with the public sector much more closely than it ever did before, than was necessary in previous periods. Left to its own devices, the private sector will do what its purpose is, which is to maximize profits. It could be, Senator, that there are agencies and instances, indeed I am sure there are, which leave the development of any area, whether it be industrial development or any other matter in which the public has a valid interest, purely to the pursuit of the profit-motivated individual corporation.

Therefore, I believe it is more than ever the responsibility of the Government to provide the environment, to give the signals, to set the guidelines, to lay out where we have to go. Then, it has to provide the incentive for the private sector to do its job. It seems to me in previous periods of emergency we have done this very effectively. We did it during the Korean war and we can do it again.

I think I mentioned in my statement that the Government can provide the kind of road map along which private industry can march and still make a reasonable profit while achieving national goals. If I could just add, with regard to the preamble, I think I made the point in my statement that it is not comprehensive enough because it deals essentially with the development of energy resources on the public domain and on other Federal lands and on the Outer Continental Shelf. These are vital national resources but they are not our total national resources in the energy field. The total energy problem requires that public and private resources somehow be brought together in a planning process.

There are a number of people agreeing with my statement urging the need for greater national planning, not in a socialist way but in the same way in which large corporations plan their future. Today there isn't a corporation worthy of its name that doesn't have a planning staff looking ahead to see where it wants to go in the years ahead. I think it is time we in the Federal Government sought to do the same thing. I think the energy area is an excellent one for this kind of national program. A national plan is essential; then, within that plan, you can rely on private industry to do the job.

Senator HANSEN. Well, I think if we are willing to ascribe ability to the Congress to spell out what the national goal should be and to show us those techniques, I think we will achieve that implementation

earlier than would be possible through the workings of the private sector in its traditional role of trying to maximize profits, which I happen to think is not a bad way. If we are to assume that, I would just say, I would like to ask you about a few things.

The oil industry will have about \$2 billion less money available this year than it otherwise would have had before the tax amendment. Will that help achieve more quickly than otherwise the case for our goal toward energy independence?

Mr. BLUMENTHAL. I think the question of where the financial resources to develop our energy sources are going to come from is a critical one. From the figures I have seen, it is going to take a lot more than \$2 billion to do this. Many billions are needed. Indeed, we don't know how much. One of the questions that has to be resolved by the Congress in order to get an information base with a clear picture, is exactly what is required. And then, knowing that, we have to ask "where is it going to come from; what are the various ways in which these resources can be marshaled?" You could do it by allowing companies to maximize their profits, hoping or expecting that much of this additional profits will be invested in exploration. You could do it by providing Government guarantees, loans, and subsidies in order to bring about more exploration and exploitation of national resources. There are a variety of techniques.

From the discussion in the public press, the very large profits by the oil companies have caused the public to look critically at the energy field and it has left them confused as to what we are really doing. Whereas, there may be an explanation for all this, I think it is probably more difficult to get a national consensus for a coherent program if the average American citizen has to pay a high price at the pump and sees in the financial pages very large oil company profits. He probably does not understand all that clearly that these profits are being reinvested to provide him with more resources. These are trade-offs, I think the Congress necessarily has to face.

Senator HANSEN. There was a sharp escalation in oil company profits for 1974, in the latter part of 1973, over what was earlier the case. I think without getting into that argument or debate, among other things we have to consider the devaluation of the dollar, inventories on hand in foreign countries that reflected the actions of the OPEC nations which automatically put the price up.

I think, too, that the devaluation of the dollar over there had a sharp effect. But there, again, it depends on the country you compare the currency with. It is fair to say, those are some of the telling effects of the profits of the oil companies. They don't look all that good now, as I am certain you know.

I think it was Texaco that just refigured its first 2 months' returns on the basis of the impact the new tax bill had; as I recall, it reduced its profits by 37 percent from what they were a year ago. Among other things, we must question the wisdom of the Congress. We not only changed the depletion allowance but we changed the foreign tax credit and depreciation taxes on foreign income.

One of the oil companies whose report I saw indicated that 62 percent of its earnings came from overseas sources; 71 percent of its total investment including exploration activities occurred in this country.

Now, I think, cutting the depletion allowance and the impact on capital and exploratory expenditures makes me question the wisdom of the Government to achieve an active role and whether a strong consensus exists. And yet, we are talking about energy independence.

I am thinking that free, uninhibited enterprise may still be the best answer. Many of the actions we have taken are counterproductive. Would you not agree?

Mr. BLUMENTHAL. I would certainly agree that the way we function, we also take a few steps forward and then sometimes we take several steps backward and certainly do things that are counterproductive. If I may briefly quote from my statement:

Of course, there are real obstacles in the way of granting the NEPB the necessary statute to become the focal point for policy and action. There are laws, agency practices, and a host of delicately balanced relations among Federal, State, and local jurisdictions that affect energy. Many interests collide. For this very reason, the bill should require the NEPB to do the following:

Identify provisions of law, standards, and institutional arrangements and procedures that are now in conflict; where energy and environmental considerations collide; where the concerns of various levels of government part ways; where entrenched bureaucratic procedures and viewpoints run athwart current needs as in regulatory matters concerning the fair price to be paid for energy and in transportation matters.

Recommend to the Congress and the President specific changes in laws or procedures to remove the conflicts that exist.

If it is found, Senator, that the tax laws or the softening of the profits is counterproductive, then obviously, the board should so recommend without getting into a debate on oil company profits. This comes from having the responsibility for a company that is in a number of fields but not in the oil business. I would exchange my lot for theirs any day. We serve the automobile industry and we have our problems and our return on net worth is not that brilliant. In this deep recession we are all struggling to maintain a minimum level of profitability.

The oil companies haven't had it that difficult, and I say that with all due respect to my friends in the oil industry.

Senator HANSEN. Well, most of these companies you know of have stocks bought and sold on the exchange. I guess there is no one keeping anyone out of the business. If it looks a lot greener on that side of the fence to the president of Bendix, I guess you can always move over there a little bit and buy these cheaper imported cars; of course, I am being facetious now, I hope you understand.

I think it begs a little on the point to say that to imply that the oil industry is out here, apart from everything and nobody can get into it, I know there are major companies as well as independents in Wyoming that are making money and there are those that are not.

I know \$850 million was paid for a lease block in the Gulf of Mexico which was being explored by the majors. They found 11 dry holes with their money. They walked off and left the lease block which they paid a bonus of \$850 million for. No one knows if there is any oil there or not, as you and I both know. But as a track record, I can't believe we are quite as ammunitioned as some would describe the Government to be in setting national goals and then trying to implement them with reasonable laws.

A long-time ago some of us warned that we were approaching a disproportional dependence on foreign sources of supply. It wasn't private business but a lot of politicians and a lot of citizens who thought it was foolish to give encouragement to the domestic industry. They said we could buy resources a lot cheaper overseas with a lot less risk so our program of becoming self-sufficient was hacked away at. Some of the companies got some favorable arrangements worked out with the Government of the United States by building refineries in Puerto Rico and the Virgin Islands and everyone had a great time buying the cheap foreign oil until the OPEC countries decided that they didn't like our foreign policy; then the climate changed.

Now we have a two, three, and four tier price system which is supposed to work out with a whole lot of adjustments. And Senator Johnston proposed that we exclude the oil that was developed by secondary and tertiary methods from the price controls we have, recognizing that our reserves are now down to about 40 billion barrels. With the known technology now, plus price incentives, we could get in addition to that another 59 billion barrels. But somebody said that might result in windfall profits. So let us keep the prices reasonable. It was agreed that \$7.50 per barrel was reasonable so that is where it was set. I don't know how near we are going to come on the reserves. We kind of mix our facts up with what would be good policy. It is popular to say that things like energy are going to cost too much. When the Federal Power Commission regulated natural gas it was okay. We even encouraged the use of natural gas and we discouraged its further exploration. I just have to admit that I am not optimistic that Government can resolve all these problems.

We go floundering along with free enterprise and we make mistakes. But, if the Government is running the show, and there is only one way to go, and Government happens to choose the wrong road, I say we have made a monstrous mistake. I would rather cast my lot with Bendix or Mobil, making their own decisions competitively and coming up with their rate, rather than having the Government mix in politics. But is appealing to the vote of the people to come up with rate answers. I don't ask you to comment on that.

Mr. BLUMENTHAL. May I just make one comment. If anyone says he is willing to cast his lot with Bendix, I have to agree with him. I think that is fine. I agree with you that one has to find the right approach. We don't want the Government in anything. At the same time, I am a little reluctant to leave it entirely to the private sector to set these priorities. I think we need a partnership between the two.

Senator HANSEN. I don't object to the identification of some goals. We have done a number of things, obviously, that will result in less oil being produced. I think that is a prime example. There isn't a scientist or an economist who can deny that putting a \$7.50 per barrel ceiling on oil is going to result in less oil being produced. We know where it is. We can get it out of the ground with present methods. We could increase that 100 percent before it would be important to tell the people that it would be more than \$7.50 a barrel, rather than face up to the fact.

I think Congressman McCormack said he thought if we were to become sufficiently short on energy in this country—and I think he said it about in these terms—he thought the “no growth” policy that seems to have become so vocal and have so many advocates today, if that were adopted, it would be a greater tragedy than losing the Second World War. That policy militates against minorities, against people with the fewest skills and the least ability to go out in the marketplace and find a job. Yet, there are quite a few people who think that is the way we ought to go. I assume you don’t?

Mr. BLUMENTHAL. I certainly don’t subscribe to a “no growth” policy. I think it is unnecessary, impractical, and unwise.

Senator HANSEN. Let me say, you have been a very fine witness. I know I speak for the other side in saying that your testimony will be given serious consideration. In the main, I agree. I don’t quite embrace our full Government, perhaps, because, at the moment, I am a part of it. I hope that we can spell out some goals and that we can take some progressive steps. I think your four points make good sense.

I was in Boston with the Council on Environmental Quality on Offshore Drilling. I was disturbed by columns in the New York Times that damned strip mining in the West and in the next breath damned Secretary Morton for talking about offshore drilling. I would like to ask the management of that paper where the lights and power come from that roll the presses and provide the visibility that I suspect sometimes, as I read that paper, seem to be absent.

Thank you very much.

Mr. BLUMENTHAL. Thank you also.

Mr. MALONE. Senator Jackson asked that I thank you for your testimony.

Mr. BLUMENTHAL. Thank you.

[Whereupon, at 12:10 p.m., the committee recessed, to reconvene Tuesday, April 15, 1975, at 10 a.m.]

NATIONAL ENERGY PRODUCTION BOARD

TUESDAY, APRIL 15, 1975

U.S. SENATE,
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS,
Washington, D.C.

The committee met, pursuant to notice, at 10 a.m., in room 3110, Dirksen Office Building, Hon. Henry M. Jackson, chairman, presiding.

Present: Senators Jackson, Haskell, Fannin, Hansen, and Bartlett.

Also present: Owen J. Malone, professional staff member for the majority.

The CHAIRMAN. The committee will come to order.

OPENING STATEMENT OF HON. HENRY M. JACKSON, A U.S. SENATOR FROM THE STATE OF WASHINGTON

This morning the Committee on Interior and Insular Affairs resumes its hearings on S. 740, the proposed National Energy Production Board Act of 1975, which I introduced in the Senate in February.

The bill before the committee proceeds from two basic premises. First, it is imperative that the Federal Government act promptly and decisively to develop the domestic oil, gas, and coal resources that are needed to meet our energy shortages and to overcome our dependence on unpredictable foreign sources of supply. The bulk of our undiscovered energy resources underly the public lands of the United States, including the Outer Continental Shelf, and it is entirely reasonable that the Government should act—and act promptly—to see that these assets are explored and developed for the benefit of all Americans.

Second, as it exists today Federal jurisdiction and responsibility in the energy resources and production fields is spread throughout the bureaucracy. No single agency is in a position to mount the kinds of action programs we need to meet the challenge we face. Instead—and all too often—the Federal role in the energy picture seems to raise barriers and to delay our progress toward domestic energy self-sufficiency. So, the bill's second premise is that the Nation needs a single specialized, mission-oriented action agency empowered to prepare and carry out domestic oil, gas and coal production programs that will supplement the efforts of the private sector, overcome present bottlenecks, and mobilize Government-wide resources to accelerate production on an urgent basis.

S. 740 is a working document, not one set in concrete. It advances the kind of mobilization board concept that brought the Nation successfully through wartime emergencies in the early 1940's and the

Korean war period. It suggests that the experience of the old War Production Board and the Office of Defense Mobilization has something to teach us in responding to the present energy emergency. S. 740 provides us a basis for discussion as we seek the most effective approach to solving what all agree is a crucial national program.

In exploring the National Energy Production Board concept the committee wants the benefit of the widest possible expression of views.

Today, we are privileged to have as witnesses: Mr. John R. Bunting, Jr., chairman and chief executive officer of the First Pennsylvania Bank of Philadelphia and a person, may I say, who has taken a very keen interest in public affairs problems affecting the economy as a whole; Mr. Charles F. Luce, President of the Consolidated Edison Co. of New York, former Under Secretary of the Department of the Interior and former Administrator of the Bonneville Power Administration; and Dr. John Sawhill of Washington, D.C., former Administrator of the Federal Energy Administration and a former Associate Director of the Office of Management and Budget.

Dr. Sawhill will be a little bit late. He has been detained. Gentlemen, I welcome you to the committee and if Mr. Bunting and Mr. Luce would come to the table, we will sit as a panel and Dr. Sawhill will join you when he comes.

I think perhaps the easiest would be for each of you to make your presentation. I will call on Mr. Bunting first and then Mr. Luce and after we have completed the statements we will ask questions by the committee. We are delighted, Mr. Bunting, you could come and participate. You have an outstanding record in the banking field.

You have never hesitated to speak your mind and I know that course of conduct will continue here this morning.

Mr. BUNTING. Thank you very much, Mr. Chairman. I feel privileged to have this opportunity. I would prefer to submit my paper with you for the record and speak on the issue in a less formal way.

The CHAIRMAN. Without an objection, the entire statement will be included as if read.

STATEMENT OF JOHN R. BUNTING, CHAIRMAN, FIRST PENNSYLVANIA BANK N.A. AND FIRST PENNSYLVANIA CORP.

Mr. BUNTING. I favor the establishment of such a Board because, as I see it, certainly the deepest of domestic issues before this country at this time having to do with the limits that are placed on economic growth by the new realities of expensive energy.

The fact is, at this time and for the foreseeable future, meaning certainly over the course of the next 12 months, we in the United States really could not afford—and I beg your indulgence to repeat that—we could not afford a substantial and sustainable recovery from the terrible recession in which we find ourselves.

One of the strongest one to one relationship that I know is between real GNP, real gross national product growth and petroleum usage.

A brisk business recovery would unquestionably lead to a substantial hike in consumption of petroleum. Such an increase would mean the importation of more oil at the very high prices that the OPEC states are receiving at this time.

This, of course, would result in an even more substantial deficit in our balance of payments than the one we have at the present time which would inevitably lead to tighter money, higher interest rates and an aborted recovery period.

In other words, not to torture an analogy, but something like the stop-go situation that has been confronting Great Britain for virtually the entire postwar period. Not necessarily because of the high cost of oil there, but because each time their economy gets going, they run into tremendous balance of payments, deficits and the necessity of slowing things down again.

Essentially, there are two ways to confront the connection between real GNP growth and petroleum consumption. One, by using petroleum more efficiently, making our whole industrial machine more petroleum efficient and second, by getting the energy, by increasing the production of energy to fuel the growth.

The reason the recession in this country has had so far a deeper impact than most modern industrial nations and the reason this recession is more portentous than the declines in activity in the rest of the world is that we use energy less efficiently than any other modern industrial nation.

Long years of cheap energy in this country produced a pattern of wasteful consumption. We do not use mass transportation as efficiently as they do in Europe or Japan and in the short run, we cannot use mass transportation as efficiently as they do there.

You do not see in the European states or in Japan the same pattern of industrial parks where industry has been diverted outside our major centers. You do not see the same kind of shopping malls, the same kind of suburban office development. All of the foregoing are designed to require the use of the automobile. It is not an exaggeration to say our entire landscape is built around the automobile.

Unfortunately, too—and no one did this by design—but, unfortunately, our cars are huge and generally speaking gas inefficient and energy inefficient.

In the next 5 years, I think, a reasonable goal would be to get ourselves into a fleet of smaller, lighter, more gas efficient cars as rapidly as possible even if we have to subsidize the acquisition of those cars.

I do not think it is too much to say that it is conceivable some time in the next 5 years you would be considering in the Senate a bill to rebate to automobile buyers a couple of hundred dollars as long as they move down in size of car.

If they trade in their large cars to get smaller ones, I think it is worth consideration to give rebates to get people to move in this direction.

We have to get into a new fleet of more gas efficient cars as soon as possible. In the long run, a 10-year goal might involve the use of more mass transportation.

The location of offices, factories, shopping centers, et cetera, should take into consideration the accessibility of mass transportation. A 10-year goal might also be to get ourselves into electric cars, certainly for intracity traffic, not necessarily for trips from Philadelphia to Washington, but within Washington itself and within our major cities.

I would think a reasonable 10-year goal would be for much more use of electric vehicles, trucks, cars, buses, et cetera.

Of course, there are other ways we can use petroleum more efficiently in our industrial system. But, we are much more capable of significant substantial savings in the area of transportation, so I have confined my remarks to the transportation area.

Now, I will turn to the increasing of the production of energy. There are two aspects of this as far as I am concerned.

One is diverting demand and increasing production of other energy forms. It is essential first to get the utilities, to the extent possible, off oil back to coal, forward to more exotic forms of energy, perhaps nuclear, solar, et cetera. There are tremendous financing problems involved in doing this that I think will require intrusions into the market system unless we are willing to wait 10 years or longer for the financing of this sort of thing.

The utilities have to do two things. One, increase their capacity, which is a financing problem in itself. Second, increase their capacity in consonance with the new energy realities. So increasing their capacity they have to increase it by getting away from use of petroleum products on to the use of these energy forms I have mentioned.

We have to heat our homes electrically, assuming, of course, the electricity is being energized by coal and other forms other than petroleum.

Of course, there are tremendous problems which I think your Board is peculiarly well established to address in getting coal production to former peaks and this is much easier talked about than accomplished.

There are tremendous problems insofar as nuclear energy is concerned which, as I read S. 740, is not specifically designed to get at.

But, it could be something in addition to the solar energy program that could come under the purview of this National Energy Production Board.

Office buildings and factories, all will have to be cooled and heated more efficiently as well as electrically. The second aspect is increasing production of petroleum itself.

I would hope here, the Energy Production Board would use incentives and use incentives very widely for the oil companies for exploration off shore.

The Outer Continental Shelf, et cetera. This is a huge part of what S. 740 is all about. I would hope we could work within the existing enterprise system, again using incentives and disincentives.

I will summarize my remarks here by saying, until the Arab-Israeli War and the subsequent embargo and the quadrupled price of oil, the American people could not be made to realize the need for a whole new approach, for energy.

Since that time, attention has been diverted by Watergate and the depression. As the depression slows and the corner is turned, we will find the road to recovery full of stop signs and full employment will be impossible to achieve unless the pattern is changed and production is increased in consonance with the new energy realities.

It is my belief S. 740 will help in this change in the demand pattern in getting an increase in energy production.

Thank you.

[The prepared statement of Mr. Bunting follows:]

STATEMENT OF JOHN R. BUNTING, CHAIRMAN, FIRST PENNSYLVANIA BANK N.A.
AND FIRST PENNSYLVANIA CORPORATION

Senate Bill S. 740 proposes a National Energy Production Board. I should like to discuss the issues that stimulated this proposal, and then speak to the question of tactics; that is, how most effectively to get action that will produce results.

The issue before this country is the limits placed on economic growth by the new realities of expensive energy. Actually, the realities are not that new, but it required the oil embargo of 1973 and its aftermath to raise them into public consciousness. Nor is the impact limited; the impact is worldwide. Very concisely, it means the economic issue that will preoccupy us through the balance of this century will be how best to use our limited productive resources. This puts us in a new ball game, and we are going to learn the rules painfully.

The old ball game—the one that has preoccupied the country for several generations—was how to employ our growing population and indefinitely increase its standard of living. That game still preoccupies us. Witness the current emphasis on re-employment, new employment and sales at any cost, to “get the economy moving again.”

The fact is, the country probably could not afford a brisk business recovery. One of the strongest one-to-one relationships I know is that between real GNP growth and petroleum usage. If petroleum weren't available and substitutes were, then the same relationship probably would hold with energy in some other form. But substitutes are not readily available. That means we must break the strong relationship between economic growth and energy use; in other words, we must find means to economic growth without proportionately increasing demand for energy if we are to have the economic growth we want. The only other route is to find the energy to fuel the growth. The only ready source is imported oil. Getting significantly more coal, or more nuclear, geothermal, wind or other energy in usable form will take years.

The imported oil is available. We could fuel a quick economic recovery. Could we afford it? It would create new balance-of-payments problems because of the price of the required oil imports. It would erode by another large notch our ability to be self-sufficient in energy. We would come closer to losing control over our own destinies.

Could we have a sharp, ebullient economic recovery and not fuel it with proportionate increases in oil imports? Yes, if the industries that must lead a recovery, such as housing and autos, suddenly could become much more efficient users of fuel. I think this will not happen suddenly, although it can happen over a period of years. Therefore, I come back to the proposition as before. We probably can't afford to sustain a brisk business recovery. Yet, most talk, articles, prognostications concern the prospects for business recovery in the usual form—the form we are accustomed to and with which we are comfortable.

I think we should be talking about how to achieve growth by learning to allocate productive resources in consonance with the new energy realities. We need to develop energy-conserving houses, cars, and ways of life.

We need also to develop new domestic energy sources. Surely we should be exploring more for petroleum in our continent and off our shores. Even more certainly, we should by now have taken concerted, massive action to plan for, research, and develop non-petroleum energy sources. Coal is a favorite example. But coal also has a finite supply, and it is slow, difficult and expensive to bring in new production and to transform it for burning in engines. Technology must be liberated in other areas than the getting of energy solely from burning fossil fuels.

A National Energy Production Board can play a major role in moving the U.S. economy away from its current restraints toward a new path of sustainable growth. In my judgment, the Board should start its work with a realistic formulation of energy objectives for the economy over various time horizons: five years, ten years, and so on. Objectives would encompass conservation as well as the development of both new fossil and non-fossil energy sources.

For the above reasons, I support S. 740 in its purposes, which I interpret to be those I have expressed above.

Tactics in going about the task of energy conservation and development, in my view, should be built around incentives. The purpose of a National Energy Production Board is affirmative as in, for example, the Manhattan Project or the War Production Board. It is a mobilizer of resources and not a regulator. In

fact, one of its tasks is to short-cut essentially negative or inhibitory regulatory obstacles. I would hope the Board could spur private initiative to a maximum extent, using the incentives to private investment that were brought into play by the World War II Production Board and any others that will work. In saying this, I do not rule out pilot and even competitive ventures by the Board itself, if they turn out to be the best way to get a project begun quickly. But the Board's role is to stimulate innovation and a competitive race to do the job, not to set up a new regulatory bureaucracy.

One of the frustrations facing current efforts to conserve energy is the use of premium fuels in less-than-premium uses. A good example is power generation by burning oil. Pending development of unconventional sources, the burning of coal provides an obvious stopgap. Large shifts to coal are blocked by several obstacles, not the least of which is the funding problems of utilities. A good initial test of the new Board might be its ability to bring together the various forces operative here, and to get funds into the utilities to make possible environmentally supportable coal-burning plants.

The CHAIRMAN. Thank you for your very fine comments, Mr. Bunting. We will follow the plan and hear now from Mr. Luce, who operated the largest power system in the Nation, Bonneville Power, and now operates the largest utility.

I do not know which one that he would prefer being in at the moment, but we are delighted to have you back with us today.

STATEMENT OF CHARLES F. LUCE, CHAIRMAN OF THE BOARD, CONSOLIDATED EDISON CO. OF NEW YORK, INC.

Mr. LUCE. My name is Charles F. Luce. I am chairman of the board and chief executive officer of Consolidated Edison Co. of New York. I formerly served as Under Secretary of the Interior and as Administrator of the Bonneville Power Administration.

I was pleased to receive Senator Jackson's invitation to submit testimony on the concept advanced in S. 740, which would establish a National Energy Production Board.

Senator Jackson was among the first Members of Congress to recognize the need for a coherent national energy policy that would assure a healthy economy, protect the environment, and reduce our Nation's dependence on foreign oil. Prior to the Arab oil embargo of the winter of 1973-74, and the coincident tripling and quadrupling in prices of imported oil, his calls for such a policy evoked little interest or response. In the past 18 months, however, the need for an effective energy policy has become a political truism. Unfortunately, it hasn't become much else. Progress toward achieving a capability for energy self-sufficiency is still about where it was when Senator Jackson began talking about its necessity.

Oil imports remain high in volume as well as price. Our Nation has not yet faced up to the hard decisions necessary to break the grip of the oil cartel.

The greatest part of the blame for our inertia lies in the structure of Government decisionmaking as it relates to energy. We do not lack for energy resources. But we still lack a comprehensive energy program and an organization—such as a National Energy Board—with the mandate to carry it out.

I believe we must act now to establish a single, powerful Federal body that would supersede and absorb the functions of the score of independent and overlapping Government bureaus and agencies that

now administer and, too often, thwart energy production. The National Energy Board that I believe necessary would have much more authority than that suggested in S. 740, and would confront the energy problem both from the demand side and the production side.

The organization of Congress to perform its oversight duties in regard to a National Energy Board would be difficult with so many of its present committees having a piece of the legislative action in energy matters. Ideally, I think, a single committee, analogous to the Truman committee that served as watchdog over the War Production Board in World War II, would best serve the national interest. I think it is a mistake to empower each House of Congress to veto major actions of a National Energy Board. Such power would require the Chief Executive of the Board to spend a disproportionate amount of his time in lobbying around the sectional interests that necessarily and properly are represented in the Congress.

The Energy Board, as I conceive it, should be assigned two mandates: the first, to reduce the Nation's extravagant consumption of energy; the second, to increase domestic energy production. Its first, immediate conservation steps must include slashing oil imports, rationing gasoline, and raising gasoline taxes. It will also be necessary to redesign automobiles to increase gasoline mileage; to impose taxes that will reward efficiency and penalize inefficiency in automobiles, to expand public transportation systems, to enforce heat-saving insulation standards, to improve the efficiency of electric generating plants as well as of light bulbs and appliances.

Such a conservation program could cut energy use by 15 percent or more. We have large customers who have cut their consumption 30 percent without damaging their production. But, this alone will not suffice to meet the energy needs of the future. Estimates indicate that there may be 25 million more Americans by 1985. Moreover, millions of our citizens are now living below the poverty level, and their standard of living must be raised. To provide the necessary jobs, homes, food and clothing, our gross national product must increase at a rate of around 3 percent yearly. Thus, even assuming a 2.7 percent annual growth rate in energy consumption—rather than the historical 4.5 percent annual increase—the Federal Energy Administration estimates that the United States will need about 38 percent more energy in 1985 than we consumed in 1973.

Conservation is not enough. The second mandate of the Energy Board, therefore, would be to devise and carry out an accelerated production program that would render the Nation so self-sufficient in energy by 1985 that it would not be necessary to import a single barrel of foreign oil.

It would tell our energy industries what is expected of each of them. It would help them raise the capital needed to expand production, cut through the redtape required to obtain licenses for new facilities, allocate scarce materials and administer intensive research and engineering programs to develop new forms of energy. It would be granted much the same authority in the energy and energy-supporting fields as was given to the War Production Board to produce war materiel during World War II.

The Board should establish a specific set of production targets, similar to the quotas that President Roosevelt assigned to industry for the production of armaments in 1939. One possible production blueprint already exists in the Project Independence report released by the FEA last November. It shows that in 1973 the United States consumed 75.6 quadrillion Btu's of energy. By intensive effort to increase production in all the energy industries, FEA experts tell us, we eliminate all oil imports and still produce the 104.2 quads of energy we will need in 1985.

Assuming the FEA projections to be generally accurate, we can realistically expect to attain energy self-sufficiency by 1985, provided we have in Washington an Energy Board with the authority to set production goals and make the decisions necessary to implement them.

To accomplish these things, an Energy Board must develop specific production goals and establish a timetable for bringing in specific components of new production.

How many tons of coal must we produce each year between now and 1985? How many barrels of oil and cubic feet of gas from natural deposits? from coal? from shale? how many nuclear reactors?

Unless we answer these questions and translate the answers from paperwork into production schedules, we will be no closer to energy independence than we were at the time of the embargo, and indeed, further away.

An accelerated program to develop our domestic energy resources would also produce an important side benefit. It would be in effect the best antirecession program our Nation could devise.

The billions of dollars that we would otherwise send abroad to pay for imported oil would circulate at home as American industry expanded domestic production facilities and created hundreds of thousands of new jobs.

These jobs would be in the construction trades, in the automotive industry, in steel plants and in other manufacturing facilities—as well as in technological industries themselves. They would not be make-work jobs, or “government-as-employer-of-the-last-resort” jobs.

They would be productive, necessary jobs that would both increase our capability for energy independence and reduce our staggering unemployment and public assistance rolls.

The public, I believe, will better accept the sacrifice necessary to achieve energy independence if the energy program tied to an anti-recession program, and not tied alone to energy goals that cannot be achieved for a decade. As important as the latter are, I think the two programs should be brought together. The public would better understand the seriousness and value of both programs.

For the short term, an Energy Board, to be effective, must be able to make binding decisions on questions as specific as to where and when and how leases for exploratory off-shore oil and gas development will be awarded.

For the longer term, the Board's powers must be sufficiently broad, for example, to allow it to develop and implement an integrated program which at the earliest date will have our Nation using oil principally as a raw material rather than burning it to heat buildings.

In this regard, I am speaking of the world's total oil supplies—not just imported oil. Our planet's oil resources are finite, and they may be exhausted more quickly than we previously thought.

Our Nation's long term energy policy must therefore be directed toward meeting energy needs at a time when oil will not be available as boiler fuel.

An energy board must begin by using the technology that we have, including that which has not yet had widescale application.

By doing this, we can develop an interim capability for self-sufficiency. The problem is now, indeed it is yesterday. We must develop today's technology, and use it to achieve energy independence until through parallel but more time-consuming research we develop the new technologies needed to meet our Nation's longer term energy needs.

During this interim period, we must increase production from known oil and gas reserves, using recovery methods that extract a larger portion of the total deposit.

We must accelerate exploration and development of areas such as Alaska and the Outer Continental Shelf where large deposits of oil and gas are known or thought to exist.

We must expand coal mining, and substitute coal for gas and oil to heat boilers wherever it is practical and environmentally acceptable to do so.

We must apply known technologies to make synthetic oil and gas from our vast deposits of coal and oil shale. And, we must increase our use of nuclear energy manifold.

All of this will be expensive even as to conventional energy sources. It will be even more expensive when it involves synthetic fuels.

That is why it is essential that an Energy Board have the authority to devise and oversee at least two types of financing programs—one to make new methods of energy production competitive, the other to provide assistance, when necessary, to electric utilities and other capital-intensive energy industries that find themselves precluded from the traditional capital markets.

For example, coal and shale oil, which total more than 90 percent of our Nation's recoverable fossil fuel resources, represent the world's largest fossile energy resources—perhaps 10 times the estimated oil and gas resources of the Arabic world.

Using them to make cleanburning liquid and gaseous fuels is one of the most promising near-term solutions to the energy problem.

The technology in good part already exists, and the FEA estimates that up to 1 million barrels a day from shale and another half a million a day from coal could be produced by 1985.

But the costs will be high, and the incentive for development low, unless there is some governmental financing assistance.

The very existence of a large research and development program that seeks more economic energy sources, or more economic methods of synthesizing oil and gas from coal and shale could well inhibit the investment necessary to get commercial-size demonstration plants built and into operation.

Further, Mideast countries can produce crude oil at 20 to 30 cents per barrel. This suggests that developers of synthetic oil will require solid assurance of protection against ruinous price competition.

Therefore, to get a synthetic oil and gas program moving, the Government probably will have to enter into long term purchase contracts with developers of oil and gas from coal and shale, or at least establish a price floor for synthetic fuels comparable to the farm price support program.

Either stimulus—purchase contracts or price floors—seems superior to high protective tariffs. On one hand, a high protective tariff would only further increase energy costs in those areas of the country that are already paying premium energy prices because of their dependence on imported oil.

On the other hand, what business is going to invest a billion dollars or more in an enterprise that might lose its competitive position in the event a tariff is decreased or repealed?

Not only the producers of primary energy will require Federal assistance in attracting the capital needed to finance new energy projects. The electric utility industry, which is a processor of primary energy, also requires it.

A decline nationwide in utility earnings—caused in great part by inflation, fuel costs and high interest rates—has seriously hurt the market for new equity issues and is forcing utilities to obtain debt capital at extremely high rates or preventing them from raising sufficient capital at any price. An ongoing survey by National Economic Research Associates, NERA, shows electric utilities have cut plant construction expenditures for 1974-79 by \$21 billion and nearly 200,000 megawatts.

The 129 nuclear generating plants canceled or postponed represent 66 percent of the nuclear capacity that had been on order.

It is not an exaggeration to say these cutbacks in nuclear construction jeopardizes our Nation's efforts to lessen its dependence on imported oil.

NERA estimates that the 110,000 megawatts of cancelled or postponed nuclear capacity would substitute for 3.5 million barrels per day of oil.

This is more than half our current total imports, and three times what we import today from the Middle East. At \$12 a barrel, this is \$42 million per day, or \$15.3 billion per year, of money going abroad.

Although some portion of the reduction in plant construction is attributed to an anticipated decline in the historical electric consumption growth rate, the bulk of the construction cuts were prompted by financing difficulties.

Such drastic cutting of today's construction budgets cannot help but seriously jeopardize tomorrow's power supplies.

Several suggestions have been made as to the manner in which the Federal Government can assist utilities to raise capital less expensively. Chairman William Rosenberg of the Michigan Public Service Commission has suggested a Federal guarantee of new debt securities issued by electric utilities.

An ad hoc committee of the Edison Electric Institute has suggested a variant of the old Reconstruction Finance Corporation.

Chairman Al Aymond of Consumers Power has suggested that the Government purchase a special class of nonvoting preferred stock in electric utilities.

The form such a program takes is something that could appropriately be determined by an energy board. The program adopted however should include a requirement for certification from the State regulatory agency that capital is needed and that the utility in question will have rates sufficient to make governmental loans or security purchases a sound investment.

Nuclear power is another area which sorely needs the type of decisionmaking power embodied in a strong energy board.

Because it uses domestic energy resources, nuclear power should be a major factor in achieving a capability for energy independence by 1985.

It should be of even greater importance in the last 15 years of this century as we work to reduce the use of fossil fuels as an energy source. Yet even today, the construction of nuclear plants has been crippled not only by a lack of financing, but also by scare headlines and the hostility of opponents who have succeeded in obtaining legislative and court injunctions.

A strong energy board could give our Nation's current—and future—nuclear program the leadership and direction it needs.

The development of advanced nuclear fission reactors, with emphasis on the breeder reactor which could extend our known recoverable uranium reserves from perhaps 40 years to several hundred years, must be a major component of any national R. & D. effort.

But, an energy board must also look beyond the breeder and into the 21st century when our remaining coal and hydrocarbon fuels should be used primarily as raw material in those industries where there is no alternative, and not as energy sources.

By that time, our principal sources of energy should be nuclear fission and fusion, and the more sophisticated uses of solar and geothermal energy.

One obvious benefit of an Energy Board would be the merger under a strong executive of all environmental and production responsibilities as they relate to energy.

If the two responsibilities remain split, the environmental and economic trade-offs and compromises necessary to achieve energy independence can be decided only at the White House. That's no way to organize a successful program.

Wanton degradation of the environment is not acceptable in our society, and we cannot lower standards to the point where the health and safety of workers and the public are threatened.

It is essential however that our efforts to achieve energy independence not impose unnecessary additional burdens on utility customers who, with inflation, are already finding it difficult to pay for a basic necessity.

And, one of the immediate opportunities for holding down costs lies in a careful reexamination of environmental standards that are stricter—and vastly more expensive to implement—that can be justified by any public benefits that have been proved for them.

The Energy Board therefore must be given a mandate to develop a more realistic balance between the need for environmental protection and the environment-related costs all of which eventually must be paid by the consumer.

In this connection, the Energy Board must also be given the authority to establish an energy subsidy program that would guarantee to those on low- or moderate-fixed incomes the amount of energy necessary for their health and safety. One possible method is an energy stamp program that could be administered through the Federal food stamp program.

To obtain energy stamps, applicants would supply data on energy needs—such as electricity and gas—to the same officials who determine the amount of food stamps for which they are eligible. Like food stamps, the dollar value of the energy stamps would depend on the applicant's need.

The recipient of energy stamps for utility service would pay the utility company with the stamps, which would have a value covering his or her basic electric and gas usage.

The utility would redeem the stamps in the same way grocery stores redeem food stamps. The most desirable form of funding for such energy stamps would be on the Federal level.

A matching provision, requiring a relatively modest State contribution—again as in the food stamp program—would seem suitable.

Unlike proposals for reduced bills for those who use modest amounts of electricity and gas, the energy stamp proposal—tied as it is to the food stamps—would exclude those whose incomes are comparatively high, but whose energy consumption is low because they eat frequently in restaurants or travel extensively.

I have but briefly discussed some of the components of a national energy program which, I believe, could be best established and implemented by a strong Energy Board.

Other witnesses would doubtless add to, or subtract from, my list. The important thing, however, is that such a Board is necessary—now—if we are to make any headway against what in truth is the worst peace time crisis in our history.

In closing, I would like to suggest one final mandate for the Energy Board. It should be empowered to banish from Washington the type of thinking that allows to be placed at our National Airport a sign which reads, "Only one passenger per taxi unless traveling in pre-formed groups."

The policy behind such a sign serves no useful purpose but to brighten the day of a visiting OPEC nation emissary. Sadly, this sign is an accurate reflection of how energy-related decisions are being made today.

The CHAIRMAN. That conclusion means that you are on the commuter quite a bit.

Mr. LUCE. That is correct.

The CHAIRMAN. Without objection, Mr. Luce, we will also publish in the record a copy of your article entitled, "A Battle Plan to Beat the Energy Crisis."

I would also like to have included in the record at this point an article from "World Oil."

[The articles referred to above follow:]

A Reader's Digest

REPRINT

A Battle Plan
to Beat the
Energy Crisis

BY CHARLES F. LUCE



Reader's Digest
PLEASANTVILLE, NEW YORK 10570

The stakes are agonizingly clear: if this country is to survive as a world power, we must mobilize—*now*—to achieve energy self-sufficiency by 1985

BY CHARLES F. LUCE

A Battle Plan to Beat the Energy Crisis

TODAY'S growing energy shortage constitutes the worst peacetime crisis in our nation's history. Indeed, unless immediate action is taken to end our dependence on foreign petroleum, a dependence that is draining our wealth away at an alarming rate, we face disaster in the years ahead.

The five-month embargo imposed on the United States by the Arab nations (which produce 70 percent of the world's exported oil) in 1973,

when we were dependent on imported oil for 16 percent of our energy, cost the nation 500,000 jobs and up to \$20 billion in production. A prolonged embargo several years hence, when we are 50-percent dependent on foreign petroleum—as we will inevitably be if trends continue in their current direction—could destroy our economy or provoke us to military actions involving the gravest risks to mankind.

When the United States found itself similarly imperiled on the eve of World War II, President Franklin D. Roosevelt did not ask the nation's industries, engineers and scientists: "What can you do?" He told them: "*This is what you must do*"—spelling out in detail how many ships, planes, tanks and other munitions

CHARLES F. LUCE is chairman of the board of Consolidated Edison Co. of New York, the nation's largest privately owned power company. He has dealt with energy and environmental problems throughout his career, and has been described by former U.S. Secretary of Interior Stewart Udall as "a convinced conservationist with unusual foresight on ecological issues."

they were expected to provide. And, with the strong support of Congress and the American people, they responded magnificently, carrying out the program to the letter and winning the war.

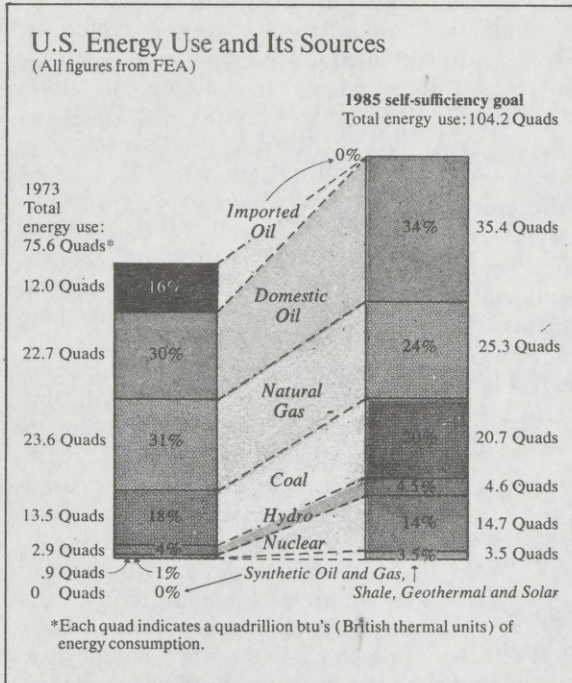
Precisely the same approach must be taken now to meet the energy crisis. President Ford's January speech setting specific timetables for new energy production and calling for the reduction of oil imports was long overdue. It can take from two to ten years to develop new oil fields and coal mines, to lay pipelines and build power plants, and even longer to develop the technologies needed to transform coal into liquid and gaseous fuel, and to harness solar, fusion and geothermal energy sources. We do not lack for energy resources, but we still lack a comprehensive program, and an organization with the determination and authority to carry it out.

Energy Board. We must act *now* to establish a single, powerful federal body that would supersede and absorb the functions of the score of independent and overlapping government bureaus and agencies that now administer and, too often, thwart energy production. The new Energy Board would tell our energy industries what is expected of each of them. It would help them raise the capital needed to expand production, cut through the red tape required to obtain licenses for new facilities, allocate scarce materials and administer intensive research and

engineering programs to develop new forms of energy. It should be granted much the same authority in the energy and energy-supporting fields as was given to the War Production Board to produce war matériel during World War II.

The Energy Board should be assigned two mandates, the first of which would be to reduce the nation's extravagant consumption of energy. Its first, immediate conservation steps must include slashing oil imports, rationing gasoline and raising gasoline taxes. It will also be necessary in the near future to redesign automobiles to increase their gasoline mileage; to expand public transportation systems; to enforce heat-saving insulation standards for homes and other buildings; to improve the engineering efficiency of electric generating plants (which waste three fifths of the heat in the fuels they burn) as well as of light bulbs and appliances (some of which utilize only 10 to 30 percent of the energy they consume).

Such a conservation program could cut energy use by 15 percent or more, but this will not suffice to meet the energy needs of the future. Estimates indicate that there may be 25 million more Americans by 1985. Moreover, millions of our citizens are now living below the poverty level, and their standard of living must be raised. To provide all these people with jobs, homes, food and clothing, our Gross National Product must increase at a rate of around 3 percent yearly. Thus, even assum-



ing a 2.7-percent annual growth rate in energy consumption—rather than the customary 4.5-percent annual increase—the Federal Energy Administration (FEA) estimates that the United States will need about 38 percent more energy in 1985 than we consumed in 1973.

The 'second mandate of the Energy Board, therefore, would be to devise an accelerated production program that will render the nation so self-sufficient in energy by 1985 that it will not be necessary to import a single barrel of foreign oil. To achieve this goal requires a specific set of production targets, similar to

the quotas that President Roosevelt assigned to industry for the production of armaments in 1939.

Fortunately, such a production blueprint already exists in the Project Independence Report released by the FEA last November. Formulated after seven months of intensive work by 500 professionals, it is the most authoritative study yet issued. It shows that in 1973 the United States consumed 75.6 quads (quadrillion btu's) of

energy. (See chart above.) By intensive effort to increase production in all the energy industries, FEA experts tell us, we can eliminate all oil imports and still produce the 104.2 quads of energy we'll need in 1985.

Supply Outlook. Assuming the FEA projections to be generally accurate, we can realistically expect to attain energy self-sufficiency by 1985—*provided* we are willing to make the necessary all-out effort, and to pay the price. Source by source, here's how the prospects look:

- Judging from U.S. Geological Survey estimates, at 1973 rates of consumption we have a 12-to-15-

year supply of measured and indicated *oil* reserves, plus an additional 30-to-60-year potential supply in the still-untapped reservoirs of the mainland states, the underwater continental shelves extending from our shores and Alaska. New techniques have also been developed that will enable us to recover from existing wells considerably more of the 70 percent of the oil that is ordinarily left in the ground. But to raise production from the present 11 million barrels a day to the 19 that will be needed in 1985, we must take the "off limits" signs down at once and open for exploration the thousands of square miles of oil lands in Alaska and off our Gulf of Mexico, Pacific and Atlantic coasts.

- As for *natural gas*, Geological Survey estimates indicate that a 16-to-22-year supply in measured and indicated reserves, plus a 40-to-80-year supply of potential reserves, could be recovered from the same sources from which we obtain our oil. There are also great quantities of natural gas bottled up in fields that are economically inoperative because of the artificially low price restraints the government has placed on its interstate sale. If we are to accelerate annual production from the present 22 trillion cubic feet to the almost 26 trillion required in 1985, the price of "new" natural gas must be immediately decontrolled.

- We have sufficient *coal* reserves to last for at least 800 years. Twenty years ago, we generated about 70 percent of the nation's electricity by

burning coal, and we could do so again were it not for the overly rigorous restrictions of the Clean Air Act. We have the technology to remove more than 99 percent of the fly ash from smokestacks, and are developing efficient, economic scrubbers to eliminate sulfur emissions as well. But unless the Environmental Protection Agency restrictions are modified, the utilities may be burning even less coal in the years ahead than they do now.

- We also know how to reduce *coal* to *liquid* and *gaseous* form. Two companies are spending more than a billion dollars of their own money to build huge gasification plants in the Southwest, anticipating the day when most of our gas will be synthetically produced. Though liquefaction of coal is less advanced, technologists are certain that the process will be operational before 1985. Another 80 billion barrels of recoverable oil are locked in the vast *shale* deposits of Colorado, Utah and Wyoming, and we know how to get it out. Although shale poses special environmental and cost problems, the FEA postulates that 250,000 to one million barrels of oil a day could be produced from it by 1985, plus half a million barrels from coal.

The problem with this synthetic oil is that no one knows how much it will cost to produce until full-scale conversion plants are in operation, and companies cannot afford to invest their money in so risky a venture. The solution may lie in long-term contracts, whereby the

government would buy the oil at compensatory prices, storing it as a reserve against emergencies.

- Generating capacity from *hydroelectric sources* could be raised as much as 50 percent by 1985. The increase would come not from building big new dams but from enlarging present dams, and through a method called pumped storage. In this latter technique, water is pumped up to high reservoirs when demand for power is low, using otherwise-idle nuclear and coal-fired generators. The water is allowed to flow back through turbines to create additional electricity during peak demand hours.

- We have the technical capacity to build any number of *nuclear power plants*. To meet our 1985 objective, we will need some 200 more than the 54 now in operation. Yet the construction of nuclear plants has been crippled by scare headlines and the hostility of opponents, who have paralyzed such plant development under an avalanche of legislation and court injunctions.

Intelligent Balance. The Energy Board must be given the authority to thwart such obstruction. Wanton degradation of the environment is, to be sure, no longer acceptable in our society, and we cannot lower standards to the point where the health and safety of workers and the public are threatened. We must restore the coal lands ravaged by strip mining, devise precautions to pre-

vent oil spills, and build power facilities in such a way as to avoid damage to the ecology. But unless we can strike an intelligent balance in which human needs are given as much weight as esthetic needs and the needs of animals, there will be no way out of the energy crisis.

As part of this balance in meeting our fuel goals, we must build a second pipeline across Alaska, and a third, perhaps through Canada, to transport natural gas. We must reconcile ourselves to the erection of oil-drilling platforms off our coasts, and build new petroleum refineries in areas such as New England, where not a single one now exists.

The cost of achieving energy self-sufficiency is going to be enormous—upward of half a trillion dollars over the next ten years. But at least the money will circulate at home to benefit Americans, and to create jobs in *this* country. The herculean drive will impose hardships on all of us. It will strain industry's resources, raise taxes, affect the environment, cause inconvenience and added expense to consumers.

But these are small prices to pay to keep America strong, free and independent. The one thing we cannot afford is delay. We are running out of time.

[From the World Oil]

GEOLOGIC COMMITTEE DETAILS U.S. GAS/OIL ASSESSMENT PLAN—\$2 BILLION PROGRAM WOULD INCLUDE 530,000 MILES OF OCEANOGRAPHIC TRAVERSES USING LATEST SEISMIC TECHNOLOGY, 100 OFFSHORE TEST WELLS

EDITOR'S NOTE: In its April 1974 issue, *World Oil* published an editorial which pointedly disagreed with a proposal made to President Nixon to establish a government-funded Petroleum Resources Assessment Commission. Purpose of the commission would be to determine remaining petroleum potential of the United States at a cost of some \$2 billion. The proposal was made to the President by the Geological Committee on Petroleum Resources, a group which was convened at California Institute of Technology on December 7, 1973. Chairman of the Committee was Dr. Harrison H. Schmitt, astronaut and Sherman Fairchild Distinguished Scholar at Cal-Tech.

In response to the editorial, Dr. Schmitt wrote to *World Oil*, enclosing the complete text of the Committee's proposal as submitted to the President and a list of Committee members. It was his thought, and that of his Committee, that *World Oil's* readers would find details of the proposal, as well as Committee membership, of interest. *World Oil* agreed and has reproduced the Committee's proposal exactly as submitted on the following pages.

World Oil is happy to make this additional information available. However, this further explanation of the Committee's proposal has in no way altered our position opposing establishment of yet another tax-funded government commission which could not help but compete with the private sector of the petroleum industry.

A PETROLEUM RESOURCE ASSESSMENT COMMISSION: A PROPOSAL FOR THE EARLY RELIEF OF NATIONAL ENERGY NEEDS

Preamble

The United States is faced with energy shortages which jeopardize the national well-being. A major program of research and development is clearly necessary to identify a long-term alternative to fossil fuels as our major energy source. Such an alternative must be available within the next 15 to 25 years. However, in the meantime, a massive shortage in the supply of fossil fuels could bring on worldwide economic difficulties. The prevention of such difficulties is presently at the mercy and control of external forces. The indefinite restriction of energy consumption that is presently required by ourselves and other nations could bring about intolerable unemployment levels and economic stagnation until future adjustments in energy relationships can be made.

We recognize that the current energy crisis in the short-term is man-made and requires a political solution. There are also certain fundamental *geologic* factors that can be illuminated. These factors should be the framework on which the Administration and the Congress base their political decisions. The purpose of this proposal is to assist in the establishment of such a framework.

We propose the implementation of several of the major recommendations of the National Commission on Materials Policy. In the Commission's report to the President and the Congress, June 1973, it is recommended that:

Recommendation 1.7 "... beyond efforts to overcome the current energy shortage, the highest energy policy priority be accorded to a research and development effort to free this Nation from dependence upon fossil fuels for its primary energy needs."

Recommendation 1.10 "... an adequate, accurate and accessible data base be compiled for materials-energy-environment policy development, with the ultimate objective of creating a computerized resource inventory."

Recommendation 4B.14 "... the Government provide rules under the terms of the Sherman Antitrust Act which would permit: establishment of industry-government-university consortia to engage in research on specific problems to further the national welfare."

Recommendation 5.1 "... the Nation's energy needs be satisfied, as far as possible, from indigenous sources."

These recommendations and the events subsequent to their transmittal clearly are pertinent to our present energy situation. We and other nations have an immediate crisis of supply for which conservation of available energy supplies provides some relief. Within 15 to 25 years we must have alternatives for petro-

leum and coal as significant sources of energy, if only to stretch-out and preserve our dwindling supplies of these unique natural chemicals. These raw materials have inestimable value to our own needs and those of future generations. In the interim between our present need to conserve energy and our future need to create alternatives in energy, relief can come only through self-sufficiency, as has been stated as national policy by the President on Nov. 7, 1973.

There is only one energy resource that can provide total national self-sufficiency within the next few years; that resource is petroleum. Full reliance on coal and other potential sources of energy requires long leadtimes which prevent these sources from being available in the required quantities. However, the continued development of many of these other potential sources is necessary for our long-term energy requirements.

Geological reasoning clearly indicates that temporary self-sufficiency through petroleum can be achieved to permit the other energy resources to be researched and developed. Vast, unexplored areas of potential petroleum resources are located in and adjacent to the United States. The exploration technology exists for assessing these land and continental shelf areas to determine which are favorable to petroleum exploration and production.

The petroleum resource base

One-half of the prospective area for the occurrence of petroleum in and near the United States is unexplored — drilling and its potential for production has not been assessed. The unassessed areas fall predominantly off the shores of the United States. These areas are beneath coastal waters which cover the continental shelf and part of the continental slope in some instances down to water depths of 8,000 feet.

We examined the nation's potential resource base in oil. The one-half of the prospective area of the United States that has been explored has provided 150 billion barrels of *producible* oil. Approximately 100 billion barrels of this oil already have been provided and 50 billion barrels remain to be produced. It appears that a like amount of producible oil can be found in the established areas by intensive additional exploration. This is a total of approximately 300 billion barrels of producible oil in relatively explored areas. By extrapolation of our knowledge of explored areas to the unexplored areas we are of the opinion that an additional 300 billion barrels of recoverable oil is probable in the unexplored areas. A similar case can be made for our resource base in gas. An added potential for petroleum exists in the unexplored areas offshore because in relation to onshore areas, they contain geologically younger rocks which elsewhere are known to provide larger fields and relatively greater quantities of oil and gas from comparable volumes of rock.

In the unexplored areas, it is likely that we may find several super-giant oil and gas fields. We use the definition that a "super-giant" field contains one billion or more barrels of oil or three trillion cubic feet of natural gas. The super-giant fields are desirable because they can provide the sustained production needs immediately. For several technical reasons oil fields can produce at only a given initial rate and will last for a definite interval of time at declining rates.

The super-giant Prudhoe Bay field on the North Slope of Alaska contains at least 10 billion barrels of producible primary oil. Such a field generally has the ability to deliver about two million barrels a day. In the undrilled half of our prospective areas several super-giant fields, coupled with increased production from our older petroleum areas and from coal reserves, would provide relief from the immediate crisis of supply.¹

¹ Prior to the present crisis the United States used about 17.1 million bpd. We are currently producing about 9.5 million bpd. Thus our current projected deficit is about 7.6 million bpd. Assuming that we can attain energy conservation equivalent to about 4.7 million bpd, that is about 20% of our previous needs, we still have an immediate deficit of about 2.9 million bpd. This deficit will grow to about 7.5 million bpd in 1980 even by conservative estimates. Optimistic estimates of expansions of non-fossil fuel energy production suggest that they will add the equivalent of 1.5 million bpd by 1980. The remaining deficit of 6.0 million bpd could be made up by coal production only by an expansion of 10% per year compounded annually. Such a growth rate is difficult to attain in view of the fact that the expansion of the coal industry is dependent on unavailable trained manpower and facilities and on environmental questions. There also appears to be no possible way that either the oil shale or the coal synthesis industry can contribute more than about 1 million bpd before 1985.

Recommendation

Geological and geophysical information is needed as a base for economic assessment and development of the undrilled coastal and offshore areas. This can be provided by basic geophysical methods using the newest technology available supplemented with equally important selective drilling for geological information. The total unexplored area is approximately 1.3 million square miles extending to a water depth of 8,000 feet. An appropriate geophysical grid covering this area would involve approximately 530,000 miles of oceanographic traverses utilizing advanced techniques in seismic prospecting. Approximately 100 offshore test wells properly located would be required to geologically interpret the geophysical information. The total program, including the necessary geological and geophysical review and analysis, is estimated to cost \$2 billion.

In order that this program may be accomplished with all possible urgency, we recommend that a commission be created in accordance with recommendation 4B.14 of the National Commission on Materials Policy, June 1973. This commission should be chartered for a limited duration of 5 years and the program funded to perform the vigorous appraisal of our petroleum resources. The commission also should include consideration of environmental factors as a major part of its responsibility. This commission could be known as The Petroleum Resource Assessment Commission. The Commission should be comprised of full-time geologists, geophysicists and other technical advisors drawn from government, universities and industry. The Commission should utilize the best scientific advice available to define the program objectives, formulate scientific strategy and direct the analysis and distribution of results.

The general management of the assesment program should be performed by the United States Geological Survey. This program can be carried out most effectively by the federal government because of the clear necessity for the release of information to the public. It is stressed, however, that future exploration and development should be conducted by private industry. The proposed assessment program would provide a basis for the effective formulation of our national policy toward the leasing of offshore lands. With public access to information, large and small industry units could be concentrated on exploration, thus conserving the now scarce scientific resources of the nation. Exporation and development under the free enterprise system of our nation will insure that the broad aim of national self-sufficiency will be attained in the shortest possible time.

Time is of the essence in providing a large petroleum supply for the nation. The Administration and the Congress are urged to implement the necessary legislation without delay.

The CHAIRMAN. Thank you, Mr. Luce. We appreciate your fine statement and comments. We are delighted to welcome again, Dr. John Sawhill, for former head of FEA and an outstanding economist and Government administrator.

We are delighted to have your views.

STATEMENT OF DR. JOHN C. SAWHILL, CONSULTANT, A. B. T. ASSOCIATES, INC.

Dr. SAWHILL. Thank you, Mr. Chairman, and members of the committee. I appreciate the opportunity to appear before you today on the bill creating the National Energy Production Board.

I must say at the outset, I am delighted the committee is considering such a bill, since as we have all said to each other several times, it is terribly important that we get on with the job of moving this country towards energy independence.

We have sat and talked many times about the need to get the job done, to get legislation passed, to take the tough actions.

I am afraid we are still talking. A number of things have been done. The creation of ERDA, the creation of FEA, and a number of other

actions which will take us in the direction of energy independence, but we have much work to do.

In the bill before us, we have the framework for what I think could be a very useful organizational structure to provide for the necessary actions to be taken.

I assume, as I read through the bill, the intent is not to substitute Government for private industry, but rather to use the National Energy Production Board as a vehicle for coordinating the efforts of private industry and for ensuring decisions are made at the Federal level, which will expedite the production of energy facilities.

In other words, the Board will serve as a focal point for private industry to come and make their case and get decisions made in an expedited fashion, replacing the large number of commissions, boards, bureaus and agencies now doing that job.

If this is correct, I would certainly support the concept of the Board. I do have a number of suggestions I think might help strengthen the powers of the Board and broaden its responsibilities to include other energy areas not included in the bill as prepared.

I think the first suggestion I would make is that the executive powers for administering the Board be delegated to a chairman. The other members of the Board should advise the chairman but the chairman should clearly be delegated as the chief executive of the Board with the responsibility for ultimately making decisions.

Unless this is done, I think there may be some confusion about who the boss really is. It is important in this situation to have that very clear since many tough decisions will come before this body. Second, I think it is important to give the Board authority, in some cases to allocate material to get energy facilities built.

When I was administrator of the FEA, I used the Defense Production Act authority to expedite the steel for the Alaska pipeline and I think similar types of authorities might be provided to the Chairman of the National Energy Production Board.

Third, I would suggest the Board be required to create a Federal strategic reserve program similar to the other programs it is required to create.

The case for strategic reserves has been made many times before this committee and I will not dwell on it. It would seem the National Energy Production Board would be a good vehicle for insuring the strategic reserves are assembled and managed in an appropriate fashion.

Fourth, I would suggest the Board be empowered to make recommendations to the Congress on an energy pricing policy. I think it is clear to us that energy prices will have an extremely important effect on the ability of private industry to get the job done, to expand energy supplies and production.

Because the Board is charged with the responsibility for expanding production, it would seem to me it would make recommendations in the pricing area.

I would also suggest the Chairman of the National Energy Production Board be the leading spokesman in the executive branch for energy and as such, I would suggest he be designated the Chairman of the Energy Resources Council as well as the Chairman of the National Energy Production Board.

I feel the National Energy Production Board should have responsibility for reporting to the Congress on geothermal energy production as well as the other kinds of energy productions mentioned in the bill.

Geothermal energy, while it is not going to be as important as coal, gas, nuclear or some of the other kinds of energy we have talked about, is an important energy source and needs Federal Government support to realize its full potential and therefore, I think, should be included in this bill.

The bill provides for the Federal Government to take a greater than usual role in offshore leasing and drilling. I would make two comments about this.

First, I think the Council on Environmental Quality should be involved in recommending actions to the Board as far as environment effects are concerned as well as the EPA.

The CEQ has done the principle studies of offshore drilling and really should have this opportunity to utilize its expertise. Second, I think any seismology, core-hole drilling or exploratory drilling which is done under the auspices of the Board should be available to the public.

The information derived from that work should be made available to the industry, to assure that everyone in the industry has the benefit of that information and can use it in future exploration or development decisions.

I would also suggest, as Mr. Luce did, that at the time the National Energy Production Board is created, that Congress may want to consider some changes in its committee organization to ensure the Board has a close tie with the Congress and one committee with which it can work since obviously this has to be joint undertaking of the executive and legislative branches.

There are a number of provisions in this bill where the Board will have to come to the Congress and ask for specific authorities and I think it would be well to have one committee, perhaps a joint committee on energy production, that could work closely with the Board to provide the necessary liaison that will have to take place if the Board is to be effective.

I would think, because regional energy considerations are so important in the work of the Energy Production Board, that the bill might provide for the establishment of Regional Energy Planning Councils to work on facilities planning and energy production planning in regions such as New England or the Rocky Mountain area. The bill could make provision for Regional Energy Administrators that would serve as arms of the National Energy Production Board and at the same time work closely with the States and focus on the problems of the States in a particular region.

In this line, the Energy Production Board, I think, should probably be required to come to the Congress with plans to provide for the financing of new communities created to expedite the energy facilities.

We have seen in the Western States a number of occasions where because financing was not available, communities have been built without adequate transportation, education, or sewer and water facilities.

It seems to me this could be one important function of the Board to see these plans are developed and adequate financing is available or

at least the need for this financing is brought to the attention of the Congress.

Along the same line, I would think the energy facilities program, provided for in the bill, should include provisions for refineries, pipelines, and electric generating facilities as well as the transportation facilities which are mentioned in the bill.

I would have to agree with the comments made by Mr. Luce, it seems to me one of the important responsibilities of the Board will be to expedite the production of synthetic fuels and in this regard it might be appropriate to give the Board the power to negotiate contracts, long term contracts, for the production of fuel from synthetic sources and this could also tie into the comments I mentioned earlier about providing a strategic reserve.

It could be that the Government should contract for the production of fuel from oil shale or coal and provide for this fuel to go into strategic reserves. In this way, we would establish proper incentives for the production of synthetic fuels.

I think, as Mr. Luce commented earlier, this would be preferable to trying to establish a price floor. I do not think it makes sense to establish a price floor on all energy in order to stimulate the production of synthetic fuel when other means are appropriate to do that.

This concludes the suggestions I have on the bill. I will be happy to answer any questions.

The CHAIRMAN. I think you have given us some very helpful suggestions, Dr. Sawhill. As I indicated before you came, this is really a working draft and we are trying to put it together by calling people such as we have here today as witnesses who have expertise in a very broad area of banking, utility, and Government and also economic areas.

I want to ask one general question. Part of our problem, when you proceed on an all-out basis, not following a business-as-usual approach, this is, as I can see the challenge to be, is to find enough private companies that are really now prepared to operate on the Continental Shelf and Alaska.

At the present time, there are virtually no independents. There are a few independents that have joined ventures in the Outer Continental Shelf, but none in Alaska.

I have suggested one approach might be the Government joint venture in bringing in a number of private independent companies to be able to participate in the development of the program.

I concede of this Board as being small, not large, playing a contractual role similar to the pattern following the Manhattan project, the Apollo program and so on.

If that is the case and if we are to provide the managerial know-how on a vastly expanded program, how do we proceed

I wonder if some of you might comment on that. Keep in mind, we are talking about an accelerated effort that we recognize the next 4 or 5 years.

Certainly, I think, Mr. Bunting will agree is critical as far as financial institutions are concerned, both in the United States and in the so-called western industrialized world. It is what we do in the next 4 or 5 years, it seems to me, can have a profound influence and impact on what happens to the economy.

Obviously, the third world is affected. It is already affected in the fertilizer area. We are simply out-priced and people cannot get the food they must have because of the high cost of fertilizer.

I would like to get your comments on this particular point. It is a management question. How do we do it? How do we put together without the Government directly doing a very large part of it?

Dr. SAWHILL. I would certainly agree with your comment, Mr. Chairman, that this would be a very small enterprise. As I said in my statement, the intent of the committee has to be not to substitute the Government for private industry but to coordinate the efforts of private industry and provide a focal point for expediting—for coordinating—energy resources.

A very small Board with the power to contract for large sums of money is probably the way to go, to establish joint ventures with private industry in certain cases and in other cases to contract the entire job to private industry.

We do not want to duplicate the efforts of private industry in the Government. Rather, we want to provide the financial incentive and coordination to get the job done.

Mr. LUCE. There is some precedent in what the Government did to increase aluminum production in World War II, where it did bring—

The CHAIRMAN. We had only one company.

Mr. LUCE. Yes. Kaiser and Reynolds and others were brought into the business through loans, fast tax writeoffs, purchase contracts, through the same techniques that I think could be employed to increase the production of synthetic oil and gas.

I think as far as the Outer Continental Shelf is concerned, there are things we already could be doing to make it easier for smaller entities to get into the business.

For one thing, our leasing policy could be directed toward selling the leases on the basis of a percent of royalty.

In other words, you bid on the royalty rather than bid cash. When you bid cash, only the big fellows are in the game.

The CHAIRMAN. It takes capital away from investment. In other words, a very large amount of front money—

Mr. LUCE. It takes capital away from the energy business. I think the chairman's question as to federal-provided joint venture is another thing that could be done. Now, whether the Government ought to take simply a debtor position in assisting new producers to get into the business or should take partly an equity position, I do not know.

I think in World War II, we did it mainly through the Government being a lender rather than an equity investor. You could go at it on an equity position if there were advantages.

I do not see the advantages at the moment but it might be worth exploring. Another thing that would be helpful to increase competition is developing the Outer Continental Shelf would be if the exploration that precedes the leasing were done on such a basis that the companies that could not afford the high exploration costs were told what the exploration showed as to potential of tracts offered for lease so they could bid on them intelligently.

How you do that is another matter. Whoever does the exploration would, of course, have to be paid. But, that plus bidding on royalty rather than bidding on a cash lump sum would go far toward getting

more companies out there on the Shelf to do the job that needs to be done.

The CHAIRMAN. May I suggest, on the Outer Continental Shelf, obviously, we have a serious environmental problem. Dr. Sawhill alluded to it and I think properly so in connection with the role of the CEQ, the Council on Environmental Quality.

I have suggested a two-stage effort that the Government through the geological survey by private contract could identify what is there so the adjoining coastal States would have the knowledge. The Governors would know exactly what the trade off's are in terms of the amount of oil versus the possibility of environmental accidents of various kinds.

It seems to me there must be a division between the two, whether you can handle it on a private basis as an initial operation is a question in my mind.

There is no incentive unless you reimburse the private companies for the drilling cost, when they have gone out and done the exploratory work and find there is an environmental problem.

So, it seems to me, from a practical standpoint, that is a very important consideration.

Mr. BUNTING. Mr. Chairman, I do not precisely disagree with your point, but I can say there is only so much we can do and therefore, you have to have priorities.

You mentioned the next 4 or 5 years. I would say in the next 4 or 5 years, we know we can increase coal production.

We really do not know what we can do on the Outer Continental Shelf, et cetera. In addition, I think an Energy Production Board—the initial effort—a huge one on the Outer Continental Shelf, would raise hopes that are more likely to be false than to be validated.

I would prefer to see at the outset of this Energy Production Board an effort to change demand patterns—very definitely, change our demand patterns—so we are using forms of energy we know we can increase in production in the short run.

The CHAIRMAN. It seems to me, Mr. Bunting, we know we have a huge reserve in petroleum reserve No. 4 in Alaska. Its estimates are not very accurate but the indications are—they are adjacent to Prudhoe Bay where the naval reserve is located—is over 3 billion barrels.

And, that is why it seems, to me, there is one situation in which we should really move. That is equivalent to almost the total reserves we now indicate we have in the United States.

I think our current estimate is 34 billion plus. I believe the last American Petroleum Institute estimate—

Mr. BUNTING. But, the pace at which we were increasing our oil consumption in period 1968 through 1973, that reserve would not last that long.

The CHAIRMAN [continuing]. I agree. We are fighting for time. You have to run in order to be able to stand still. But, I wanted to say, we do have some identifiable areas where there are large reserves of oil that I think we should exploit and I think the very fact we are mobilized and moving on an all out basis—

I think the marketplace and OPEC itself that—this is a personal basis—

Dr. SAWHILL. Mr. Chairman, I would say, in response to that, the fact that Great Britain has found the North Sea reserve has had an impact on their energy policy.

If we knew for sure we had reserves on the Outer Continental Shelf and knew the size of them, that could not help but influence the course of oil prices and our ability to ensure a stability of supply.

Mr. LUCE. There is another thing we must think about here on the Outer Continental Shelf and that is natural gas. I agree with Mr. Bunting, we should develop our coal resources rapidly, but to attempt to replace the natural gas being exhausted here on the east coast with gassified coal would take more time than drilling off the Atlantic shore.

We do not hook up any new gas customers at all. We are withdrawing gas from interruptible customers. By 1980, unless there are new supplies we will have to start cutting off firm gas customers.

Nineteen eighty is only 5 years from now. We have to move fast in that area. Natural gas is important in our area in New York.

You do not think much about natural gas as a primary energy source, but it provides 17 percent of all of the energy used in the New York metropolitan area.

Electricity provides 25 percent. This is another reason to get out there on the Outer Continental Shelf and rapidly.

The CHAIRMAN. Senator Fannin.

Senator FANNIN. My position is, you should do everything you can to encourage private industry to go forward with development of these great resources and I feel on something such as the National Energy Production Board, if that should become a reality, the concentration should be in that direction, not in competition but in coordination with the private industry to go forward as some have suggested.

And, I think it has been made quite clear, this will be a possibility. Here we are holding back on leases, holding back whether it will be on Outer Continental Shelf leasing geothermal.

I think the Federal Government has an obligation to move forward rapidly. I do think there are places where the Board such as the distinguished chairman has recommended and I have been looking at his statement this morning.

And I think I could apply a few suggestions. We have a Pacer program. I do not know if any of you are familiar with the Pacer programs.

They have been studying at Los Alamos. They will have a manmade geothermal steam program here as an area in which the Federal Government may become involved, should become involved, because this is something that perhaps private industry could not do.

Is it an opinion that you gentlemen have that this is an area in which the Federal Government should become involved with this development?

Dr. SAWHILL. I would certainly agree that it should, Senator Fannin. But, I would also say to this, having talked with a number of operators—small operators—in the industry recently, their problem is, because this is such an expensive operation, because most of the people in the industry are relatively small with the exception of Union Oil, another thing they need is some kind of joint venture with the

Federal Government or bottom-hole money or some participation in bottom-hole money so they can actually drill wells and understand what our geothermal resources are.

Second, another thing I think they need in the geothermal industry is some kind of demonstration plant built on wet steam.

I do not think we are going to find very much dry steam in Arizona. For example, if we could get a demonstration plant, a wet steam, plus bottom-hole participation plus the PACER program, I think we would be in good shape.

Senator FANNIN. I appreciate what you have said. In southern California, San Diego Gas and Electric, you have a project—they have had a project—going for some years.

But, what I am talking about is getting your opinion in which direction we should move. If we move in this direction, we are going in competition, as I see it, with private industry.

If we move in the other direction, we are supporting private industry and going forward with it. I would like to mention something else, I am vitally interested in.

That is solar energy. I know Mr. Luce referred to it in his statement. And, I would say we have great opportunity before that comes about.

We have immediate opportunities of using solar energy for immediate utilization for supplemental use.

Mr. LUCE. Yes, I think that is true in areas, particularly such as Arizona where you have a lot of sunshine. In New York City, where we have cloud cover about half of the time and where our buildings are such high buildings so there is a small collective area on the roof, there is not as much opportunity as in Arizona and New Mexico.

But, the design of the buildings whether they are houses, factories, apartment buildings, even in the New York area, more attention needs to be paid in the future to solar energy, both from the standpoint of heating or cooling.

And, there is a great opportunity to do that.

Senator FANNIN. I believe the greatest potential of solar energy is in power development. I know Dr. Sawhill is familiar with the—Research firm.

On the side of an eight-story building, what has been done in that regard. We have Dr. Burke Nelson on the staff working with the staff, the Senate Interior Committee staff and several years ago, he was working on some thoughts as to using meteor craters that have natural slopes and using that type of cavity for solar energy development.

In other words, using the same ideas of the building there in France, only of greater magnitude. We have come up with the thought of what can be done with the pits, the open pits, left after the mining is gone, utilizing those open pits as a tremendous collector of heat.

I do not want to take a great deal of time but on the eighth of this month on page S5458 of the Congressional Record, there is a comment as to the pits that are available and what could be done with this especially with the use of mylar.

I do not know if you all are familiar with it. It is an aluminized material. It has a reflective capacity of around 90 percent as compared to glass and the thought is we could have a department and Dr. Nelson

said the electricity that could be generated by this could be used to generate hydrogen by electrolysis which the hydrogen would be put in a pipeline system and must be available for burning and so it would be even the storage principle.

Have any of you heard about this program or looked into it at all? I would appreciate it if you could have someone in your organization, especially the Consolidated Edison Co. could do more in this regard.

If you could have some of your engineers look into it, this offers a potential, that is almost unlimited.

When we talk about the side of a building maybe 100 by 100 feet, we are talking about an open pit mine 1,000 feet deep and 2,000 or 3,000 feet across and has roads circulating down to the bottom.

The reflective material could be placed on the north side to reflect the south, the collector, you could see the potential involved.

There are areas perhaps in New York where this could be done along canyons or something of this nature. It has potential.

Do you think this would be something that perhaps should be included in tests like this? Should it be included in legislation such as we are talking about here today?

Mr. LUCE. I do not think that kind of solar program is going to solve the problem in the next 10 years. I think that effort ought to be going on in parallel with what this Production Board would do.

Senator FANNIN. This could be done in a year's time. There is no reason why this could not be tested on in a year's time. Are you familiar with the Martin-Marietta program they have involved in solar energy in Arizona?

Mr. LUCE. No, I am not, sir.

Senator FANNIN. This particular thought may be new although Dr. Nelson has been just thinking about it and discussing it, at least the past few years. But, using the mylar is something new. It is inexpensive as compared with glass, is not destructive like glass.

If we are going to use solar energy, I am not talking about price programs, I am talking about doing what can be done within the very near future to try to bring about a leveling of the load.

As I understand it, the greatest problem you have, you have to have quite a percentage of increased capacity just because of peakload.

Is that correct?

Mr. LUCE. Yes, our load on a hot summer day will be 2 million kilowatts higher than the highest loads in the wintertime.

Our loads on the hottest days will be twice as high at 4 o'clock in the afternoon as they will be at midnight.

Senator FANNIN. If there is some way you can start leveling off that load if it is solar or whatever it might be, it would be a tremendous help to you, both in capital expenditures as well as operating costs.

Mr. LUCE. Yes, it would.

Senator FANNIN. I know this is a little bit off the subject, exactly what is covered in the chairman's legislation, but I think it is something we should look into and I am taking advantage of this opportunity with your Consolidated Edison Co. having the expertise.

I will give a copy of the statement I made before you leave. And, I would ask if you could have your people look into it and Dr. Burton Nelson, I know, would welcome meeting with your people or discussing it with them.

I am not talking about something that could be done in the year 2000, I am talking about something where the pits are available now, everything is available except the proven technology that this is beneficial, that seems from the information collected to date.

And, I appreciate the opportunity to have you look at it. I have other questions but I have used up my time, Mr. Chairman.

The CHAIRMAN. We are delighted to welcome Senator Stevenson to the committee. He heads the subcommittee in the energy field of the Commerce Committee.

STATEMENT OF HON. ADLAI STEVENSON, A U.S. SENATOR FROM THE STATE OF ILLINOIS

Senator STEVENSON. Thank you, Mr. Chairman. I appreciate the opportunity to speak of the role of the Federal Government in energy resources.

I am here, as you indicate, not only as a representative of the Commerce Committee in a cooperative effort to develop sound energy policy. I want to commend you, Mr. Chairman, for introduction of S. 740, which creates a National Energy Board.

It is, I believe, an important step in the right direction. It does not go quite as far as I would like it to go, but at this point I would like to say a few words.

I think, it is time to create a new government and to deal with responsibility for formulating national energy policy and then carrying out that policy where private enterprise refuses or is unable to act.

Such an entity should have the power to develop a coherent national energy policy, assessing our needs in view of realistic consideration goals, setting national production targets, assessing private industries production goals to meet those targets, and then putting in motion those government activities necessary to fill the gap.

The National Energy Production Board could be that entity. But, as proposed in S. 740, the Board's authorized activities are, generally speaking, to study and recommend though it can explore in the Federal domain.

And, it has, I understand, the authority to mandate other agencies to develop the naval petroleum reserves. I think the Board should have greater authority with which to implement a national energy policy and in particular that it should be able to do the following, assert the authority of the U.S. Government in negotiations with foreign governments for the purchase of crude oil at reasonable and stable prices, explore and inventory Federal gas resources in the national domain including the naval petroleum reserves, establish and maintain a readily available strategic reserve, and to develop synthetic fuel industries.

These are all activities authorized in S. 701, the legislation I reintroduced this year to create a National Energy Supply Corporation.

In your consideration of S. 740, I would urge you to grant the same authorities to the National Energy Production Board. Under S. 740, most of its functions, which is the establishment of strategic reserves, are, as I understand it, the subject of more studies which the Board is to submit to Congress before further action can be taken.

While it is essential to require the Board to report to Congress on a regular basis, I believe it would be preferable to authorize the Board to undertake these essential activities without more delay, subject to Congressional disapproval where appropriate.

The duties of the National Energy Supply Corporation has authorized that S. 701 could become the action arm of the Energy Production Board with standard authority to implement as well as develop national energy policy.

The National Energy Production Board and the National Energy Supply Corporation are not only compatible and complementary but in my judgment, long overdue. Mr. Chairman, this is not a radical proposal.

It is, I submit, an obvious proposal. A proposal already adopted in various forms by all of the major industrialized nations.

No other nation leaves it so completely at the mercy of private oil companies and foreign governments. Such a Board, as I propose, and as is outlined in great detail in the legislation which I alluded to, could do more than relieve the United States from undependable sources of agency.

A board which has some idea of the value of the resources in a given public tract of land before it is released to private development is in a position to obtain a reasonable price—

As it is now, large tracts in the national forest are still being leased at 50 cents an acre for 10-year lease terms. No understanding, none whatever, of the potential resources available in those parts of the public domain.

States and other units of the Government could contract with the Board for the environmentally sound and profitable development of State and other public oil and gas resources.

Many States have recently expressed an interest—the States with offshore rights—California is a noted example. The Board could enter into joint ventures with the independent producers and sell oil to independent refiners to prevent major oil companies from eliminating the little competition that remains in the production and refining of oil.

Mr. Chairman, the failure of our political and economic machinery to ensure adequate supplies of energy at reasonable prices has produced public frustration.

A kind of handwriting on the wall. If the country continues to suffer at the hands of one large concentrated industry, public patience will run out and that industry may someday be regulated, broken up, or in fact, nationalized.

I would prefer to see the free enterprise system encouraged and strengthened. Most of all, Mr. Chairman, I want to ensure the Nation's independence of inflationary and undependable energy sources, and without still more delay, that is the purpose of S. 710.

Thank you.

The CHAIRMAN. Thank you, Senator Stevenson. I just want to say, we will continue to work with your committee as we have in the past, and, when we get to the markup, we will ask you and your associates to come over and join us as we take up the bill for amendments.

Now, as I understand it, this would be a corporation.

Would it be a Government corporation in the traditional governmental corporation sense?

Senator STEVENSON. Yes, it could be called anything you wanted. We have called it a corporation. I think the closest model we have now is probably TVA.

It could take other forms.

The CHAIRMAN. You are not fixed on that, it is a concept you are talking about?

Senator STEVENSON. No, no. Other nations have created corporations in which private ownership plays a very large part, such as Shell and other companies.

The CHAIRMAN. Canada has such arrangements. Not too long ago, we set up a Government private arrangement. I think they took over one of the companies, if I am not mistaken—

Dr. SAWHILL. For exploration in the Arctic Islands.

The CHAIRMAN. Yes, they formed a corporation. England now has over 60 percent of BP. Norway set up a government corporation.

All of these companies are actively involved in oil activities.

Senator STEVENSON. They all have it in one form or another. The U.K., the Canadian Government has at least one corporation and as I understand it, the Provinces of Canada are beginning to set up other corporations.

The CHAIRMAN. Thank you, Senator Haskell.

Senator HASKELL. Gentlemen. I think Senator Stevenson will probably disagree with the thrust of my question, but it occurs to me and I would like to get your reaction, that through—really—the efforts of the chairman of the committee, ERDA has been set up for research and development for private and public partnerships depending on the state of the art.

We are absolutely, at least in my opinion, about to obtain accurate information on costs various oil companies incur.

We are unable to obtain, on a governmental level, the reserves of various sorts. If this production board and also on the conservation side we have taken steps in the Senate the other day, the bill was in, and we will take other steps.

But, if this board basically gathered information and made recommendations so if the Congress had some facts it could put its feet against, if we could have those facts, that would be better than giving the Board a great deal of authority such as the distinguished Senator from Illinois would do and such as in here.

And, that is, gentlemen, assuming research and development is ongoing. My question is, is it not wiser to sometimes try to muddle through?

Mr. LUCE. Senator, I do not think we can afford this muddling policy at the present time. Time is running out on us. We need to pull together in a single Federal agency, the kinds of powers that are necessary both to enforce a policy of national energy conservation, which we are not doing at the present time, and to bring in new production that we need so we are not dependent on the OPEC countries.

Senator HASKELL. Obviously, we must have mandatory conservation. Obviously, we must have Government assistance in the research and development.

I think we ought to have some antitrust actions against some of the major companies, and I use the term muddling through somewhat facetiously but nevertheless to give a Board the authority to enter into a contract which gives them a certain base on for instance tar sands because we suddenly say, we need tar sands and, in my estimation—if you are going to give support on the downside, are you going to protect the public on the upside?

Dr. SAWHILL. We are already protecting the public on the upside with the mechanisms we have in place. We are already controlling prices.

Senator HASKELL. I beg your pardon, Dr. Sawhill, but we are not protecting the public on old oil prices, on new oil prices—

Dr. SAWHILL. The average of the old and the new prices provide considerable protection to the public.

Senator HASKELL [continuing]. Let's take tar sand. A company comes in and says it will cost us so much a barrel. We, therefore, guarantee a price, whatever a rate of return should be on their cost.

And, then sometime later, we find their estimate of costs were all off base. If we give some national energy board—production board—the authority to enter into such a contract, it seems to me in some ways, Congress has sold the store.

Dr. SAWHILL. I do not think that at all. I would have to agree with Mr. Luce. We have a big job to do. We have to begin to develop the energy resources in this country. I think the fact is, we have already given the FEA the authority to collect information.

That is done.

Senator HASKELL. In a limited source. Maybe, I could ask Mr. Luce to answer this question.

Dr. SAWHILL. I would say you have given the FEA very broad authority.

Mr. LUCE. I think you could protect the public interest and still get tar sand. First of all, by calling for competitive bids for a contract to develop the tar sands so that potential developers would bid a price.

The subject of the bidding would be the lowest Government guarantee that the bidder would take.

So, to begin with, you have an incentive to cut the cost. Another important way to protect the public interest is through taxation, for example through excess profits taxation.

Senator HASKELL. A mighty inefficient form of taxation. Mr. Bunting, what is your reaction?

Mr. BUNTING. My reaction, Senator, is the downside risks of muddling through are enormous. After all, we have now 9 percent of the work force unemployed.

I share with you an apprehension about giving this kind of power to an energy board. And, I am apprehensive about S. 710 as I have come to understand it this morning. I think it would work out to be counterproductive.

It would fan the apprehension we have over giving power to a Government board. But, personally, S. 740 does not frighten me.

Senator HASKELL. I should have prefaced it by saying I have not studied S. 740. Now, Senator Stevenson, you certainly deserve equal time.

Senator STEVENSON. Some of the economic consequences of high energy costs are beginning to be quantified now by sophisticated economic analyses including among others, Otto Eckstein at Harvard.

And, the conclusions bear out all the worst assumptions and they do not begin to reach the opinions, the payments of deficit payments resulting from the continuous transfers of oil importing to oil exporting countries.

Without going into the economic consequences, which I will be glad to do if anyone is interested, I would like to say we cannot muddle through.

We are paying a high price for having muddled through too long, an intolerably high price, not only of our economic welfare, but the stability of the world.

Now, you said shouldn't we get the information and then make judgments? We have been acquiring information but we have not been acting.

And, notwithstanding the authority for the FEA, we have acquired all of the information that we need in particular on actual production costs.

The purpose of my proposal is in part to acquire information. As an operating entity, it could for the first time give us actual operating costs.

That information could be used in ongoing efforts to determine reasonable domestic wellhead crisis for gas and for oil.

And, instead of resorting to our present blunt regulatory instruments whereas the administration has proposed of leaving the regulation of domestic oil and gas at wellhead prices to foreign governments, to OPEC, that beyond such information gathering authority we would need to use it. That is the purpose of my presence here. Simply to suggest that we have been gathering information and muddling along too long.

It is time now to act. There is no commodity as vital to the welfare of an industrialized society as important as energy.

It is as vital to the welfare of the United States as air and water is to your body. At the present time, we are not assured of adequate supplies, especially of natural gas and at reasonable prices.

We better just quit this muddling through and do what every other industrialized nation on the Earth has already done, to recognize the essentiality of this commodity.

The essentiality of an assured supply at a reasonable price by creating a board along the lines I have suggested. Those countries, they are not all radical, they are not all Socialist, they cover the entire ideological spectrums.

They all have one thing in common, they put the survival of their country before the welfare of any particular industry.

In the United States, since the days of Teddy Roosevelt, the U.S. Government has let its energy policy be dictated by and for the benefit of one industry, now the Nation's largest and most powerful.

Senator HASKELL. I agree with a great deal of what you say, Senator, but in closing, what if we have a vigorous agency as we do to develop energy resources if we have good conservation policies which we can put in and if we had had adequate information and if we have a free market, which I am not sure that we do.

That is the way I would like to go rather than your Board.

Senator STEVENSON. I agree with you and you know that we do not have a free market. And, it will be a long time before we do.

Senator HASKELL. Thank you very much.

The CHAIRMAN. Senator Hansen.

Senator HANSEN. I was late coming in. I will be happy to yield to Senator Bartlett.

The CHAIRMAN. Very well, Senator Bartlett.

Senator BARTLETT. Senator Stevenson, as you know, I appeared before your committee, the Commerce Committee, and your subcommittee many times and testified about your bill.

I think four times you have been very kind to hear us.

Senator STEVENSON. I am trying to make the industry happy by calling it NESCO but I think the acronym FARCO is more suitable.

Senator BARTLETT. I think you stated in talking about having an accurate idea of fair prices as one of the bills of NESCO. In other words, creating a yardstick such as TVA—

Senator STEVENSON. If I may interrupt, Senator. What I suggested was, in determining price levels at the price wellhead, it was essential to have accurate figures on actual production costs.

And, we do not have actual access to that.

Senator BARTLETT [continuing]. How can you say with assurance that this would provide a yardstick on prices at the wellhead when this company would not pay any income tax when this company would have first crack at Federal offerings on the Outer Continental Shelf and when, I think you will agree with me, 20 percent of the leases would be worth about \$1 billion.

And, where the Federal Government is providing, if I remember correctly, from provisions of the other bill that it was about a \$50 million per year grant to this company.

Senator STEVENSON. In determining actual production costs, it simply attaches reasonable production costs to any noncash profits, according to the corporation.

Our accountants assure us this is a relatively easy thing to do. But, this corporation would not be establishing fair prices, it would simply be giving us some of the elements of actual production costs in which other agencies, including the FEA and the FPC, would determine the wellhead prices.

This corporation would sell at the same prices as any other corporation.

Senator BARTLETT. I meant to say costs instead of prices. But, I do not think you are saying how you are going to have an apples and apples comparison, you will have a conversion factor that will create a lot of doubt in a lot of minds.

You could create, could you not, a straight-off entity with a government management presumably coming from the private sector, on exactly the same basis, bid for a lease.

Wouldn't that give you an accurate comparison?

Senator STEVENSON. Not production costs, production costs would be the same. Production costs to NESCO of drilling an offshore well would be the same as the cost to EXXON, unless it is a more inefficient operation.

Drilling that well, you could add in the taxes if you want. You could add in the value of the leasehold. If there was some benefit to be derived from imposing a tax benefit on it, but I would say yes, this corporation is subject not to the low taxes that are still imposed on the oil companies, this corporation would be subject to 100 per cent income tax, all income.

Net income goes to the benefit of the public and all I am proposing is that the public enjoy the development of the resources that are owned by the public.

Senator BARTLETT. Mr. Bunting, it has been stated——

Senator STEVENSON. Mr. Chairman, may I be excused unless there are any additional questions?

Senator FANNIN [presiding]. Senator Stevenson, I am wondering about these things that you have just said. I do not know if any other country in the world has been as successful in developing petroleum resources and in helping other countries develop their petroleum resources.

It seems to me we are talking about countries, socialized countries really, that are involved and what you are suggesting is that we follow their procedures and will that not lead to nationalization.

Senator STEVENSON. As I tried to point out, I believe if the Government fails to take some moderate step such as I am proposing, it will not be long before the public demands immoderate steps.

Those steps could include fully regulating the producers, treating them as the utilities as has been seriously suggested by others, among them members of the Senate.

Or, more drastic measures such as the nationalization of the oil and gas industry. This is a proposal for preserving and recreating free enterprise.

Senator FANNIN. Help me evaluate free enterprise, with the program you are advocating it is anti-free enterprise. You are taking the operators and what they have been doing and I just do not follow you at all.

Senator STEVENSON. Let me spell it out, Senator Fannin. I am a former producer, a lawyer for—I was an independent producer, an unsuccessful one, but in the course of that experience I have learned something of the disadvantages to which the independent producers are put in competition with major companies which are driving up leasehold costs out of reach of the independent producers taking over more and more of the production segment of the oil and gas industry.

They already control the pipelines, almost all of the pipelines. They control about 80 percent of the Nation's refining capacity and now they have driven out most of the independent marketers and dealers to take over the distribution.

This corporation—and, in fact, it is mandated to enter into getting independent producers back into the marketing section.

It could be mandated, where necessary, to supply independent refiners with crude oil to ensure a source of supply for refiners and competition at the refining level.

If by then, the independent refineries have folded their tents, it could go into the refining in order to supply independent marketers and distributors with product in order to preserve free enterprise at the distribution level.

Senator FANNIN. When you are saying free enterprise, everything you are saying is in opposition to it.

Senator STEVENSON. Now, Senator Fannin, there is no free market in the oil and gas industry.

Senator FANNIN. I beg your pardon. You can say that all you want, but there is a competitive factor in the oil industry.

You know that.

Senator STEVENSON. I do not know that. I do not believe \$11.25 a barrel is a free market price.

Senator FANNIN. What price is the world market price?

Senator STEVENSON. \$11.25.

Senator FANNIN. What is the average price here in the United States?

Senator STEVENSON. You would have to average it between the free market price, at \$11.25 and \$5.25 to come out with a price.

The average is a result of the controls on old oil.

Senator FANNIN. Of course, the thing about it is, the controls on gas, to my way of thinking and I certainly think I know a little about it—I spent quite a few years in that industry—as a result of controls and I do not think you will dispute the controls that have been on natural gas have resulted in a turning away from natural gas and oil, a few years ago 23 percent of our energy was produced by coal, today it is dropping below 18 percent.

And, with the turn of events, I do not know what is going to happen but certainly we know the control of natural gas has been a great factor of what is happening in this country.

And, you are asking for more control.

Senator STEVENSON. No, I beg your pardon. We are trying to reform and limit the control of natural gas. We are proposing also a major increase in the wellhead price of natural gas but I do not intend to substitute OPEC control of natural gas for you as control of domestic natural gas.

Senator FANNIN. We have had quite a few votes, Senator, as far as natural gas is concerned. I do not remember the Senator being on the side of decontrolling natural gas.

Senator STEVENSON. I have a proposal worked out which I think you are familiar with.

Senator FANNIN. I am familiar with what the Senator has advocated in the past but I am not familiar with his desire to decontrol natural gas or decontrol other products.

It has been the other way around.

Senator STEVENSON. You are right. I am not in favor of substituting OPEC controls for U.S. controls. But, I am in favor of reforming the regulation of natural gas prices eliminating the disparity of natural gas prices in the intrastate and interstate markets to end the diversions of natural gas away from interstate markets in many uneconomic uses in many States.

And, also for permitting a price rise of wellhead natural gas which strikes a balance between the producers on the one hand, their needs for incentives, their needs for adequate financial sources and the needs of our economy.

On the other hand, beyond that point of about 75 cents which is proposed in this bill, the project independence report included that a higher price would not produce any more natural gas.

Senator FANNIN. I certainly dispute that from the standpoint of my own State. My State is not a producing State but I know the people who supply product to the State of Arizona and the people who purchase that product.

The utility companies who purchase that product would like to see decontrol and they feel very competent the increased price would bring additional drilling, additional pickup lines and would afford an opportunity to get a larger supply of gas.

And, some of them are in a testy position. We have one city, Tucson, Ariz., that is as badly affected as any place in the United States as far as a shortage of natural gas is concerned.

I think from my own investigation, from my own experience in this field, certainly decontrol would be extremely valuable and a free market would certainly accomplish the objectives you have discussed, that you have in mind, that should be brought about by controls, by doing away with the free enterprise system.

I cannot follow you at all, in your conclusions.

Senator STEVENSON. We disagree. That is an understatement.

Senator HASKELL. Thank you.

Senator FANNIN. Thank you, sir.

Senator HANSEN. Senator Stevenson, I know you are awfully busy, but would you have time for a few questions? Let me thank you for taking time to come down here.

I know you are interested in a lot of different pieces of legislation. We appreciate an opportunity to have you spell out how you think we could improve our situation.

I was interested, particularly, in your observation in response to a question asked by Senator Haskell that you did not think we could afford any longer to try to muddle through and this country should do what other countries throughout the world have done, both to protect their people and to protect the national interest. I was wondering, would you identify one or two or three countries, whichever ones you would think might best illustrate the kind of action by Government that would bring in contrast, the sharp contrast, between that kind of intervention and what we do here by way of contrast?

Senator STEVENSON. Our model would be different from any other model and that is partly because of the status quo. The highly developed industry we have and partially because we have substantial resources which do not exist in many other countries.

I have a study underway right now which is attempting to analyze the experience of major industrialized countries, of major natural gas and oil corporations.

I could not tell you what should be our model and what we should follow as a model. All I can tell you, they are taking similar steps—many in the United Kingdom or Canada—if we wish to judge their success, others have gone much farther.

I am proposing the Mexicans have nationalized the industry many years ago and have not suffered nearly the extent of other countries from the embargo and high oil prices.

The country that has done the most to take the most steps is probably Norway.

Senator HANSEN. Maybe I misunderstood your first statement. I thought you were observing a number of countries had done what seems

to be, in general, ways we proposed here in this kind of legislation and that had proven to be better than what we are doing here.

But, I gather now—are you saying these other countries are launching on this experiment that has not been proven as successful as it might be?

Senator STEVENSON. If the question is, have other corporations been sufficiently successful, then in the example of Norway and Shell, the answer is yes. In the case of British Petroleum and Great Britain, the answer is yes.

But, the energy crisis overtook us a little bit earlier than expected and no one anticipated the embargo which now suddenly makes our vulnerability very obvious.

So, companies are proceeding now to take steps along these lines and in many cases, as the *Canadian* case, the results are yet to come in.

Senator HANSEN. You mentioned Norway and Britain as two examples. Does their gasoline sell for less per gallon than ours does here?

Senator STEVENSON. It is much higher.

Senator HANSEN. Is electricity any less per kilowatt than it is here?

Senator STEVENSON. I think in most of your European countries, it is much higher.

Senator HANSEN. Maybe that is overly simplistic to ask that question or make that comparison but I would have to be more strongly persuaded than I am now before I was willing to reject the way we are now doing it—

Senator STEVENSON. The reason for the high energy cost in Europe—

Senator HANSEN. Many governments fail to recognize the benefits of free enterprise.

Senator STEVENSON. There are major differences in tax laws.

Senator HANSEN. I know you share a concern I hold with you and that is we should do what we can to protect ourselves from a reimposition of the embargo.

While it is true, we didn't make an adequate response or anticipate as well as we might have, it is not quite fair to say no one anticipated it.

There are a number of people on record on both sides of the aisles, Democrats and Republicans, who said we were on a collision course if we continued to build up our dependency on foreign unstable sources of supply.

Not that anybody ever listens to me but I have a few speeches I made 6 or 7 years ago which said we are getting into a position where the Arabs did not like our foreign policy and they might shut us off.

It does not pay very much to say, I told you so.

Senator STEVENSON. They did not listen to me either and I was saying it also.

Senator HANSEN. They should listen to you and me more and they would be better advised. I know you are in a hurry to get away but I would make one final observation.

When the first shut-down on Middle East petroleum occurred in the 6-day war back in 1967, if I remember correctly, it was nobody except the United States that came to the rescue of the world.

We had enough oil in the wells that could produce more in Texas and other places of the country to take care of our own needs and do a pretty fair job of supplying the rest of the world.

On that score, I would have to think there is some merit in the way we have gone about trying to produce and develop these natural resources.

Would you have some comments on that?

Senator STEVENSON. Yes. We have been blessed with abundant, natural resources but also, and it seems to me to be irrelevant but a very efficient oil and gas industry which has developed resources abroad as well as at home.

I think abroad, to some extent, the expensive domestic resources but that, Senator Hansen, is not the point. Let me remind you of something else that happened during the embargo to make a larger point then, about the relative efficiency of Government, versus private corporations. I recall, after the embargo, reading in the Wall Street Journal an article which reported that Texaco had been accused of leaking oil to the United States during the embargo.

And, the Texaco response was instantaneous and Texaco's response was, as reported in the Wall Street Journal, never rebeyed.

Our Arab masters and no oil was delivered in contravention of the embargo rules to the United States. It is not only a question of price, reasonable price, reasonable profit, but it is also, it seems to me very largely, a question of assured supplies, strategic reserves.

At home, the exploration and development of the public domain, public energies and in the negotiations with the foreign producers, it is imprudent and unwise to leave yourself, I believe, to the mercies of private entities which are powerless.

Senator HANSEN. I am not familiar with the corporate management of Texaco, but I would say, if they feel the loyalties I suspect most of their management does to this country and despite the fact they may have been saying what was not true, it was sure in the public interest.

I can think of no more destructive, disruptive statement that could have been made insofar as hurting rapport we have with countries around the world than to have said they were leaking oil over here. I take exception with those who want to criticize the CIA too from putting bugs in Russian limousines.

I want to do everything I can to help the U.S.A. During the embargo, some of the Arab countries were unaware of the fact that through the international network of supply, many of the companies operating in the Middle East were able to divert oil to this country from other sources and we did not suffer as much as we would have.

If a person were to grant some reasonable validity to the scenario, it would seem to me nothing could be more hurtful than for us to say, sure, we were leaking oil here and these other countries knew about it.

I would think King Faisal and others would have been in an impossible situation with respect to their Arab neighbors over there.

Maybe this is not what happened. I am maybe dreaming the whole thing but I have reason to think there may be some small shread of truth to it.

If there is—and, I do not doubt at all that Texaco said it—but, if they did, I would have to say, diplomatically, that is a perfectly legitimate place to lie.

Senator BARTLETT. Mr. Bunting, you were referring to the capital shortage, right? And, also its importance in finding oil and gas, coal, and various sources of energy.

I think the concern a number of us have is for our short- and mid-term. We are all betting on our technology, in the long term, in the 20th century, but getting there is the problem.

Do you find expended capital to energy expiration and development is in direct relation to the energy found and produced?

Mr. BUNTING. I can not say there has been a precise correlation in the past but in some measure energy was easier to find then.

I will put it that way. But, I do not think the lessons of the past have been terribly constructive as far as the future is concerned.

I think we all believe we have to dig deeper. Now, when you dig deeper it is more expensive.

Senator BARTLETT. In other areas such as timber or manufacturing, would you say there is no—are you saying there is no relationship between the capital available—

Mr. BUNTING. No, I am saying the energy situation—in most situations there is a direct correlation between capital expenditure, the funds available for capital expenditure.

I think in the energy situation at the present time, very likely we are going to have to spend more than we expended in the past, proportionally more.

Senator BARTLETT. That is what I thought you said earlier. Now, in that, would you anticipate more capital could be available to those companies engaged in energy for the short- and mid-term by controlling interest rates.

Just as the price of crude oil is controlled at the present time, in natural gas—controls supposedly for the benefit of the consumer.

Mr. BUNTING. The quick answer to your question is no. I think it would be disruptive to our economy to control interest rates.

Not that wild fluctuations are not disruptive too, but it would be disruptive to the workings of our economic system to control interest rates.

Senator BARTLETT. Suppose it was done for the protection of the consumer, which is the argument you used for controlling prices of crude oil and various energy sources for protection of the consumer and you can argue it is protecting him against sufficient supplies.

Mr. BUNTING. That is the point Senator Fannin made earlier and, I thought, very well, referring to natural gas.

Senator BARTLETT. Would it have the same effect as controls as would come from this board on prices that do exist now?

Is there not a direct relationship or is there a difference or is there something unusual, sinister or otherwise about the energy industry that makes price controls so very important in order to protect the consumer, that do not exist in other areas where the consumer is also interested and affected?

Mr. BUNTING. I think price controls are uniformly, ordinarily, unfortunate. There can be a situation where for a brief period of time price controls can be useful in restoring stability.

I think interest rates, just as prices in general perform a service of allocation, interest rates allocate funds on only various users in the case we are talking about here.

A control on interest rates, and I would assume you are going to control them at a lower level than they would otherwise be, would let loose torrents of demand in the housing area.

At least, that is ordinarily the case. I would think a great capital expenditure in the area of housing over the next five years would probably not be in our best interest.

Senator BARTLETT. I think Mr. Luce would agree the lower gas prices have increased in lowering demand. And, the parallel you gave, I agree with.

Now, you mentioned one other matter but you were talking pretty much in the area of zero energy growth.

Mr. BUNTING. I think Mr. Luce mentioned something like one half of the rate of the recent past, or something like that.

Senator BARTLETT. I thought you were talking about—because we have operating at pretty much, recently, the level.

The level does not stay constant. And, we are pretty close to what we have been for 1973 and 1974 and the figures I have are just part way through 1974.

So, they are not always correct.

Mr. BUNTING. The total demand in 1974 was well below 1973. I personally do not think we have changed the relationship between energy and real GNP in any measurable way.

We have not changed the relationship between energy and real GNP in any measurable way at this time.

Senator BARTLETT. We had testimony yesterday from Congressman McCormick. He pointed out, and I agree with him, the over zero growth would result in a catastrophe worse than losing World War II, which I thought was a pretty strong term.

Now, Mr. Luce, what is your position today? And, what is your position on deregulation of gas at the wellhead? Has your position changed, or is it the same?

Mr. LUCE. We have favored the deregulation of newly discovered gas.

Senator BARTLETT. That is a recent position.

Mr. LUCE. Congress should deregulate natural gas so we can protect our gas consumers by bidding for it in the States where it is being discovered, or alternatively Congress should extend Federal jurisdiction over intrastate sales. What is happening now, there is not any new gas going into the interstate pipelines, except what is discovered on Federal lands.

As I mentioned earlier, we are faced with what appears to be the likelihood we are going to start to have to disconnect firm gas companies in the next 5 years.

I think that is terrible. I think deregulation of new gas would be the simplest and easiest way of enabling us to compete in the open market of natural gas and hopefully to protect our customers against a loss of this important energy source.

Senator BARTLETT. Certainly, I agree with you on deregulation of new gas. It seems to me that it would be very unfair for Congress to authorize the FPC or any other agency to control the intrastate market when the people in that market have paid for that gas with higher prices, as you well know.

Then, they have created these supplies. So, whatever cubic feet they would consume, they were paying actually more than a cubic foot in pricing. I am sure you are aware the Outer Continental Shelf exploration for gas is practically nonexistent.

It has declined to practically nothing. Whereas, the intrastate gas market or the exploration in the market area has increased very sharply.

Isn't it true the average price of gas at the wellhead paid by Con-Ed or by the utilities would be something like 30 cents a thousand?

Mr. LUCE. We do not buy at the wellhead. We buy it delivered in New York City. Presently, it is running 75 cents or 80 cents per million Btu, which is less than half of what residual oil is costing us per Btu.

Senator BARTLETT. It is 35 cents to bring it there, a rough figure, but probably fairly accurate. So, the 30 cents a thousand would compare with crude oil at about \$1.80 a barrel.

How long has it been since crude oil was \$1.80 a barrel? Or, do you have that knowledge? Is that any kind of a reasonable comparative price?

Mr. LUCE. It has been 3 or 4 years, at least.

Senator BARTLETT. At 1957, it was \$3.09. It went down, but it did not go down that much. So, it has been a long, long time.

You favor the deregulation of natural gas. Now, the gentleman sitting next to you has said in the past, if I am quoting him correctly, and I will give a chance to correct me if I am not, that decontrol of domestic oil, the old oil, the 5.25 oil would amount to about 4.6 increase in gasoline.

Would that be too large an increase if that is what it was, and unfair to the consumer in your opinion, if you knew we had the decontrol or deregulation of natural gas on the one hand and decontrol of oil on the other hand?

And, an estimated 4.6 percent increase in the cost of gas? Would that be unfair to the American public when it would bring forth the mechanism of the marketplace on the supply side?

Mr. LUCE. I think as regards old oil, first of all our company is not privileged to buy much of this oil. We are dependent on imported oil.

Senator BARTLETT. But, doesn't this affect it right now? Bringing in imported oil at \$12 and something a barrel and for every barrel we we do not produce of domestic oil at \$7.50, we have to replace it with the high-price oil.

So, it affects you as well as the OPEC, the market and everything.

Mr. LUCE. What we have advocated is an averaging, a mixing of the old oil with the imported oil to try to give the consumers on the east coast, who are taking such a beating from this, some relief.

I think to reduce the oil consumption, we have got to go to higher gasoline taxes and to rationing of gasoline. That is not a very popular idea, but this is the problem.

Senator BARTLETT. Does that do anything for supplies?

Mr. LUCE. It does a great deal for demand.

Senator BARTLETT. It does nothing for supplies? Is that correct?

Mr. LUCE. I think you have to attack the supply problem in a different way.

Senator BARTLETT. One way to do that would be to free up the price. Do you think that 4.6 is unfair.

The CHAIRMAN. May I interject there, Mr. Luce. You are aware that not all oil brought in is controlled. That is the cartel price and 40 percent.

Senator BARTLETT. It is a little under the cartel price. It has been from a dollar and up out in Oklahoma. That is a pretty big amount.

Mr. LUCE. I would open up new production areas. I think what we need to do, and particularly—I have an east coast point of view—I would hope we could get out on the Continental Shelf.

What is holding us up from getting out there is not the price, it is the terrible slowness with which the Federal Government has addressed the environmental problems.

I do not think price is really holding up production on the Atlantic shelf.

Senator BARTLETT. But putting in a larger concept of having sufficient energy, do you think there is enough capital, or too much of oil exploration and development to be reasonably self sufficient in a reasonable length of time or to improve our position?

Mr. LUCE. Certainly, the whole program for developing domestic energy, whether it is oil or coal, or uranium, or whatever is going to require all the capital we can assemble.

It is an enormous job. I suggested in my statement, I think there is a Federal role to be played in this as a banker, if you will, to assist those companies, those enterprises, who through normal credit markets are not able to raise the capital needed to accomplish its objectives.

Senator BARTLETT. Could you give me the Eastern point of view then on the 4.6 on the decontrol of old oil? Do you think that is unfair?

Mr. LUCE. It seems to me to decontrol old oil at this time would be to place an inflationary effect on the economy that it should not have, and to create windfall profits that should not be imposed on our economy at this time simply because of what has happened in the OPEC countries.

Perhaps, if you accompany decontrol with high excess profits taxes and credit against the excess profits taxes investments in new production do assure that windfall profits from the old oil are devoted to the national objective of increasing energy, then I would say that would make some sense.

Senator BARTLETT. I think there are those who believe the real problem facing us is the energy shortage and on the supply side there are those who say that consumer prices excess profits that there be a windfall profits tax with a plowback.

And, there is additional assurance right there the Congress at any time as you well know can remove from the oil companies any excess profits they desire to.

Now, Mr. Sawhill, I was just furnished yesterday, I believe it was, from the 92d Congress about 2 feet of books on the energy study, and I assume the 93d Congress, it may be 3 feet.

At least, there have been a lot of meetings since I have been here. I am wondering what kind of information would this Board provide the Congress that it does not already have?

Senator BARTLETT. Would this be passing the buck? What would it accomplish?

Mr. SAWHILL. It does not seem to me the purpose of the Board is to provide information. I would not see it as that way.

Senator BARTLETT. Just to report back?

Dr. SAWHILL. It might report back on a plan showing how to develop our coal facilities, what incentives could be developed and what kind of incentives in refining, what kind of incentives in legislation is needed to do that?

I do not think providing information about production costs is a proper function.

Senator BARTLETT. What I am talking about is reporting back on energy policy which I think is the responsibility of this Congress and the administration.

Dr. SAWHILL. I, maybe, do not understand the function of the Board but it seems to me its function should be to expedite things to get the job done, to allocate materials as I did in the case of the Alaska pipeline.

To work with the States to make some of the tough decisions, we have to make about environment tradeoffs in building energy facilities.

Its function is more as a coordinator and expeditor of policy, not as a developer of policy.

Senator BARTLETT. You used the word coordinate before and expedite and assist would be the proper function and goal of this.

Let me read section two to you, called—on page 14 of the bill.

The Board is authorized and directed to prepare and carry out a Federal oil and gas exploration program. It goes on and says, the exploration program shall supplement the activities of the private sector and shall provide for immediate commencement of the comprehensive exploration of the public domain of public lands the United States on the Outer Continental Shelf to obtain sufficient data.

Does that assist with your—is this your idea of expediting?

Dr. SAWHILL. The Board has exceptional powers here on the Outer Continental Shelf. The problem with that is we can either sit around and debate on it or we can move on and get the task done.

I am afraid, unless you take some measures other than what we have taken in the past, we will be sitting here next year, the year after and there will be no drilling on the Outer Continental Shelf.

How are we going to get it done? It seems to me we are in a stalemate with the Federal Government on the one side, the States on the other with disagreement in Congress on how it should be done.

How can we break this stalemate? How can we find what the reserves are in the Outer Continental Shelf?

Senator BARTLETT. You are raising a very interesting question. But, I was wondering if you thought the words assist and coordinate and expedite were consistent with the words authorized.

Dr. SAWHILL. This is an unusual situation. I do not think the Government should develop the Outer Continental Shelf. I don't think any of us do. But, if it is necessary for Federal Government to contract for the drilling of the few holes in order to get them drilled, I would like to see it done.

Senator BARTLETT. What is unusual about the oil industry, or the companies or private enterprise or whatever.

Dr. SAWHILL. What is so unusual about the Outer Continental Shelf? You have an emotional issue, you have a great concern on the part of the people living in the Coastal States about drilling taking place on the Continental Shelf.

You have, obviously, a strong political action on the part of governments of those States as we read about it in the newspaper and they have certainly told me.

I went out to California and suggested at some point we would have to begin drilling on the Outer Continental Shelf and Mayor Bradley asked for my resignation.

I did not know how prophetic he was at the time. The point is, how do we break this deadlock? I am concerned about it.

I do not know how to do it. I know it is important to get this drilling done. I would argue strongly of all the ways we could develop energy supplies. Probably the least environmentally destructive would be drilling on the Outer Continental Shelf. But, I made that argument and I obviously did not make it very successfully.

The only way to get the job done is perhaps to get an authority like this and do it quickly. I think the delay is intolerable.

Senator BARTLETT. You have raised an interesting question that I think is worthy of discussion but I realize the new exploration is in an area of unregulated price.

Do you find—or do you have any objection to the decontrol of old oil?

Dr. SAWHILL. It seems to be there you have another tough issue. I have suggested a system for decontrolling old oil which is a good one.

And, that is to define old oil 1972 production from the field as, let's say for the sake of argument, 12 percent a year.

That 12 percent a year being roughly decline rate in the field. So, if you made the additional investment and your production did not decline by 12 percent a year, then you would have the benefit of that oil as new oil.

It seems to be that is the better way to do it.

Consider the political realities, the economic realities, the concern people have about the inflationary impact of immediately lifting this control.

Why not start on a program now which would move us toward decontrol. If you did it the way I suggested, here, in 1975, the production from the field would be the 1972 production less 36 percent.

The CHAIRMAN. May I interrupt for a moment. Mr. Bunting has a 1 o'clock train to catch. I wanted to express appreciation of the committee for your coming down here and volunteering to join in these discussions.

It has been most helpful. I hope it will be productive in the end. Thank you very much.

Senator BARTLETT. Mr. Chairman, thank you very much. I want to thank Mr. Bunting, Mr. Luce, and Dr. Sawhill.

The CHAIRMAN. Before we leave, I have some students in the committee library. I want to express my deep appreciation to members of the panel, Dr. Sawhill, Mr. Luce, and Mr. Bunting.

I know I speak for all of the members of the committee. May this comment on my part appear at the end. And Senator Hansen, please go ahead.

Senator HANSEN. Thank you, Senator. I appreciate what you have done in suggesting what I think are very reasonable ideas for solutions to our energy crisis. You speak about the frustration you have encountered in New England. I would ask you, Mr. Sawhill, to comment upon that.

Recently, the New York Times in editorials criticizing former Governor Stan Hathaway of Wyoming for encouraging the development of Wyoming's energy resources including the strip mining of coal.

In that same editorial, having dispatched Mr. Hathaway to what they hoped might have been his fate, they turned on Rogers Morton and criticized him for wanting to lease the Outer Continental Shelf for oil drilling.

Do you think Mr. Luce should have turned the lights out on the Times.

Dr. SAWHILL. In all my dealings with Governor Hathaway, I found him to take a very balanced view. He testified at our hearings on Project Independence in Denver.

It might be useful for members of the committee to look at that testimony. He did a very eloquent job of expressing the need to expand energy resources and at the same time, to protect the environment.

I hope this will not become a big issue surrounding Governor Hathaway because I think generally he has presented a very balanced view.

Certainly, in that statement he did.

Senator HANSEN. I do appreciate what you say about Governor Hathaway, but I must say I deplore an editorial policy that seems so inhibited or so guided by very sincere but oftentimes misguided environmentalists who seem not to understand the realities of our energy problem.

But, for the most part, aside from the littel hydroelectric power which we generate in this country and the small amount of nuclear power which has been a problem in New York State, the State howls for more power all the time but no one can agree where the next power-plant should be built.

And, it certainly is a fact, the average person, when he flicks the light switch, is benefitting from fossile fuel, either coal or oil.

And I must say, some people who damn the strip miners on the one hand and damn the offshore drillers on the other ought to try going without lights to see if maybe they could try to rearrange their priorities a little bit.

I am a bit weary of the myopic attitude the New York Times has displayed.

Senator FANNIN. That would be a good note on which to end but I would like to commend Dr. Sawhill because I have been in California at the time he went into the lions den and saw the press he got. I do commend you for the position you took.

I want to ask one question of both of you. Have you seen any reluctance on the part of the oil companies to drill and explore on the Outer Continental Shelf?

Dr. SAWHILL. No, I would not say there has been a reluctance to explore.

Mr. LUCE. On the Atlantic shelf, the companies have been willing to get out there for at least 10 years.

Senator FANNIN [presiding]. Senator Haskell and I attended some hearings in Boston. At those hearings there were expressions regarding the environment but at the same time I think it was well brought out the safeguards that exist and also the statistical information.

I think it would have been helpful out in California. In all of the complaints in California, there was no permanent damage that did result.

I think in the last 5 years, there have been four spills that amounted to over 250,000 gallons. I think it is so overexaggerated.

I am as concerned as everyone else is concerned about protecting our environment. Certainly, in our State of Arizona, it is vital to me.

That is why I am building up the great hopes we can go forward with the solar energy programs because I think they offer tremendous opportunity. I appreciate very much if we could get information from either of you.

Especially, on the research that might have been done—has been done. Although, there is not as much sunshine in New York, there is considerable sunshine and as we all know even on a cloudy day, there are great benefits that accrue as far as solar energy is concerned.

I express my appreciation to both of you for the fine contribution you have made, as usual. And as we go through this legislation and other legislation, this will be extremely helpful. Thank you.

[Whereupon, at 12:35 p.m., the hearing was adjourned, subject to the call of the Chair.]

APPENDIX

ADDITIONAL MATERIAL SUBMITTED
BY SECRETARY FOWLER

ENERGY SERIES

The Atlantic Council
of the United States

Policy Papers

World Energy and U.S. Leadership

by Harlan Cleveland
Foreword by Henry H. Fowler

PRE-PRINTED FROM
The Atlantic Community Quarterly

World Energy and U.S. Leadership*

By Harlan Cleveland

FOREWORD

IN JANUARY OF 1974, THE ATLANTIC COUNCIL established an Energy Policy Committee to consider the problems of national coordination and international cooperation in the field of energy. During the second half of the year, three task forces carried out detailed inquiries into the financing of energy supplies, alternatives to imported oil and gas, and accelerated development of these and other conventional energy resources.

The year just past has seen an extraordinary outpouring of facts and forecasts, news and opinion, options and scenarios about the interlocked complications that make up the "world energy problem". Major reports have issued during 1974 from the Ford Foundation, the Committee for Economic Development, the Trilateral Commission, and the Federal Energy Administration (on "Project Independence"). The Atlantic Council task groups have also been able to draw on a massive compendium of statistics and analysis by the Organization for Economic Cooperation and Development. Important additions to this literature have come from Legislative hearings and Executive speeches, and from journals, weekly newsmagazines and daily newspapers.

It is clear that the abrupt ending of the era of cheap energy and concomitant changes in the financial situation of many nations constitute not only serious dangers for the world's trade and payments systems but also for the cohesion of the democratic industrialized nations upon which their security and prosperity depend. As the basic purpose of the Atlantic Council is to contribute toward more effective cooperation and cohesion between these countries, the present situation is naturally of concern to it.

Another scholarly research report would be redundant. But the Atlantic Council's mode of work is not basic research; it is policy analysis. Our purpose here is to suggest the framework of U.S. action which would best reflect and express the interdependence of U.S. decisions with those of other nations, especially our closest allies in the "Community" of industrial countries which now extends across the Pacific as well as the Atlantic.

I take pleasure in presenting herewith a preliminary paper by the Hon. Harlan Cleveland for the Council's Steering Committee on

**Report of the Committee on Energy Policy of the Atlantic Council.*

Energy. This paper has been written in the light of the discussions of the Steering Committee and the Working Group. While the final responsibility for the views expressed is that of the author, the Council is pleased to present them for public discussion and debate.

The members of the Steering Committee are listed on the third cover.

HENRY H. FOWLER
Chairman

I

THE PREDICAMENT: "GRAVE BUT SOLUBLE"

The oil embargo of 1973, followed by a more than fourfold rise in the price of crude at the point of shipment, made the Organization of Petroleum Exporting Countries one of the movers and shakers of modern history. But OPEC did not create the "energy crisis", just moved it from some-other-time to here-and-now, from a genteel debate among the knowledgeable to a major public issue that every oil-consuming people expects its political leadership to do something about.

The crisis is plural: relevant action cannot be taken on any one of its parts by any one of the actors without thinking hard about all of its parts and all the other actors. We agree with our Government's stated posture in a speech by the Secretary of State: that "the problem is grave but it is soluble" and that "international collaboration, particularly among the industrial nations of North America, Western Europe, and Japan is an inescapable necessity." Our proposals are addressed to the lag between what our leaders say and what the ponderous machinery of government does.

The main elements of the predicament are familiar enough:

- For decades past, cheap energy powered industrial growth and Mideastern oil came to be the cheapest form of energy. Along with the assumption that air and water are free, and the further assumption that the condition of the environment is some one else's problem, cheap energy was built into the cost structure of "progress". The more developed the economy, the more energy it used. The more Mideast oil an industrial economy used, the more it was, in effect, subsidized by exploitation of the Mideast's inexpensive but not inexhaustible "cash crop".

- U.S. per capita energy consumption came to be eight times the average for the rest of the world. Even among industrial nations, Americans came to be the big energy consumers, using twice as much per capita as the British, 2½ times as much as the Germans, and 4½ times as much as the Japanese. Yet the rapid rise in energy demand (tripling in the European Community, doubling in the United States

between 1950 and 1970) was no more regarded as a "problem" than the doctrine of exponential growth it fueled and reflected. Any "problem", it was thought, must be on the supply side of the equation.

- An analysis published by the International Institute for Environmental Affairs in 1972, not long before the Arab oil embargo, showed that world energy demand had doubled in the previous twenty years, and projected another doubling in the next fifteen years. At this consumption rate, proven reserves of oil—which provides more than one-half of the OECD nations' primary energy—would last only a generation. Early or late, massive substitution of other fuels was already in the cards. The candidates for substitution had already been identified: roughly in order of probable appearance, they were more coal; nuclear fission; oil from tar sands and "oil shale"; gasses and liquids made from coal; "natural energy" such as the direct use of the sun, volcanic heat, wind, tides, and temperature differentials in deep water; and nuclear fusion.

- But with substitution mostly still in the talk stage, the industrial nations remained crucially dependent on oil from the Middle Eastern countries. They became the core of OPEC and OPEC accounted for nine-tenths of Japan's, two-thirds of Europe's, and 17% of United States primary energy supply. This large and obvious vulnerability was discounted, even in NATO military planning, because of a settled assumption that the oil producers, especially the Arabs, were congenitally unable to get together and act as a cartel.

- They nevertheless did so. The end of cheap energy was hastened by the education of younger leaders from the oil-producing nations, who studied political economy in North America, Europe, and the Soviet Union. They came to have a common perception that their oil was undervalued and non-renewable, that it would be bypassed in time by alternative sources of energy, that they were being deprived of its fruits by foreign ownership and control, that demand for it was comparatively inelastic in the short run, and that it happened to be so concentrated that its producers, not its users, could decide what it was worth while it lasted. The dawning of this perception happened to coincide with the felt Arab need for a political weapon in the war against Israel. Led by the Arabs, the oil producers glued themselves together to practice embargo and fix prices, and a new child of monopolistic competition was born. In the light of their own history, the oil-consuming societies which had invented cartels could not and did not sustain for long a posture of outraged innocence.

- The differences in vulnerability among the industrial countries were immediately reflected in their reactive moves. The Japanese and most Europeans pragmatically adjusted their attitudes toward Israeli behavior and Arab development enough to avoid a shut-down of Mideast oil supplies. The United States, with more economic and financial options and more stake in promises to Israel, felt the lash of embargo—and began to think seriously about overcoming its seven-million-barrel-per-day import vulnerability.

- More far-reaching than the political use of economic power, of which this was not the world's first example, was the sudden change in the price of oil during the second half of 1973. The cartel raised the price of crude oil shipped from the Persian Gulf about 4 times the mid-1973 price, to about \$10 a barrel. The action was sudden, massive in its damage to consumers, spectacular in its enrichment of producers, and in the short run unanswerable.

- Policies to offset long-run supply-demand imbalances and reduce critical vulnerabilities, most of them already analyzed in leisurely policy papers, became an urgent object of domestic governance and international politics. But instead of action there followed, in the United States, some months of rhetorical flourishes—unilaterally declaring a policy of U.S. energy independence by 1980, unilaterally trying to get the price down by jawboning. In a situation that obviously required a major conservation effort, a reduction in imported oil, increased use of indigenous coal and oil and gas, and increased production of electricity from nuclear power plants, the United States tried to handle conservation by exhortation, imported more oil in 1974 than in 1973, used more oil to produce electricity in 1974 than in 1973, produced and used no more of its own coal in 1974 than in 1973 (or in the 1940s for that matter), did little to encourage exploration and more production of domestic oil and gas or coal, and saw its nuclear power program go sour.

- The oil-price crisis affected other countries in large but different ways. Europe did not act as a Community; bilateral arrangements with the oil producers, and unilateral measures to restrain demand, were the order of the day. Japan, most vulnerable of all, started hesitantly down the conservation road, accelerated the rethinking of its rapid-growth policy (which was already under fire for environmental reasons), and bent its political efforts to avoid either a Japanese or an OECD-grouping confrontation with the Middle Eastern producers. The poorest countries, hardest hit of all in their development plans, were torn between pride in the action of their suddenly rich colleagues in the "developing world", and desperation about how to

pay for high-priced oil to energize development plans in which cheap energy had been a prime assumption.

- Sober analysis and practical diplomacy gradually took over from the Babel of voices urging defiance of, appeasement of, or solidarity with the new converts to cartel power. An international consumers' group (the International Energy Agency) was proposed by the United States and negotiated to signature in less than a year. Domestically in the United States, an Energy Resources Council was appointed and an Energy Research and Development Administration (ERDA) was set up alongside the Federal Energy Administration (FEA). With this machinery in place, and a sense of direction beginning to emerge from the multiple analyses of the macroproblem, the United States and its "Atlantic" friends across both oceans are ready for hard decisions and continuous bargaining. Or are they?

II

AN ATTAINABLE PROSPECT

In energy planning as in other forms of human activity, the urgent is the enemy of the important. There are problems of staggering size, unprecedented character, and desperate immediacy just ahead. But it helps to get them into perspective by looking first a good deal farther down the road.

Some time toward the end of this century, only 25 years from now, some fundamental shifts in attitudes and priorities, already in evidence here and there, may become dominant. The prodigal unplanned use of resources—energy, food, key minerals—may well have given way to a careful and cooperative effort to stay well within the "outer limits" of the only biosphere we have. The emphasis on a more equitable distribution of wealth and opportunity, already a prime political trend inside industrial nations with very different social systems, may well have led to global arrangements to combine development with social justice in the developing countries as well. The expansion of economic and social opportunity may well have changed attitudes on family planning, as has already happened in the United States and elsewhere. Decisions perceived as vital to human survival—in such fields as food reserves, money supply, energy, ocean management, and net resource transfers (some post-patronizing form of "foreign aid"), may well have been effectively internationalized in institutions which can speak and act for most of mankind.

The major actors in the continuous bargaining involved will doubtless still be nations, perhaps fewer and, on the average, larger in

reach, resources and population. "Ownership" of the means of production, and of service industries, may come to mean even less than it does today; management will mean correspondingly more, under public regulatory arrangements designed to ensure that (whatever the ownership) those in control of resources and processes act broadly in the public interest.

By that time, coal and its derivatives and uranium will probably be the main fuels used to make electricity; "natural energy" may be important, at least in a large number of localities; fusion power may look feasible and if feasible, eventually plentiful. Sooner or later, petroleum may come to be regarded as not primarily for burning—but rather, as a very complex molecule, much more valuable for use in making a variety of synthetic materials and substances.

There is nothing inevitable about all this; but it is an attractive and attainable prospect. It will be rendered more or less probable by the actions Americans and others take during the next few years. The way we tackle the short-run issues should be consciously related to such a strategy for the humanistic management of interdependence in the much longer run.

III

PRICES, PROFITS AND PETRODOLLARS

From this perspective, what are the issues already pressing for resolution, and the options for immediate action? They fall in two categories—the overhang of Middle Eastern money, and overdependence on Middle Eastern crude oil.

At the price they have set for their oil, the members of OPEC stand to earn some \$600 billion from the rest of the world during the next five years. Once earned and paid, these monies will be indistinguishable from other foreign exchange—there is no such thing as a petrodollar outside of writings on the subject. The question is, how much of these earnings can be used, and how much will have to be saved—by investments in financial assets?

Some of the OPEC countries (Iran, Algeria, Iraq, Venezuela, Indonesia and Nigeria) can use most or all of their earnings by stepping up their own development ambitions. The others (Saudi Arabia, Kuwait, Libya, Abu Dhabi, Qatar) have 65% of OPEC's proven reserves and 48% of the current OPEC output, with only 12 million population among them. There is no way they can invest more than a smallish fraction of their earnings in imports for their own consumption *and* development.

Experts differ about how much of the bill can be paid by the oil-consuming nations with their current exports to the oil-producing nations; the lower end of the range is one-third of the "petrodollars", the higher end is little more than one-half. We are looking at a cumulative OPEC-nations surplus of \$250 to 350 billion by 1980 available for investment or the purchase of future claims on other nations' goods and services.

Even a reduction in the price of oil, say from \$11 to \$7 a barrel, would leave such large amounts of these extra funds, swirling around in a monetary system that lacks the leadership London and New York used to provide, that the problem would be far from solved. It does not, all things considered, seem wise to expect that the major producers will reduce prices and thereby increase the speed with which their irreplaceable resource is siphoned out of their sovereign territory. Realistically, this is likely to happen only if the major oil-consuming countries can be unified into a single negotiating unit that offers attractive and equitable *quid pro quos*.

These huge windfall profits have one interesting effect in the short run. While the higher price for petroleum products contributes to inflation by raising costs and justifying wage increases, the monetary effect is of course *deflationary*. Oil payments by industrial countries can be seen as a form of forced savings, a much greater tax increase on current incomes than the democratic government of any Western nation would feel able to exact. Some of these savings, looking for a profitable home, will predictably come back to the industrial countries as capital investment. To the extent that they are invested in high-productivity, efficient growth industries, from which they could expect the greatest return, they can serve the industrialized world as much-needed source of investment capital; if the same amounts were taxed away by national governments in the industrial countries, those revenues would not likely wind up as investment capital. To the extent that the funds are invested (in direct aid or through international organizations) in development of the poorest "Fourth World" countries, they will be financing transfers of technology and skill from North America, Europe and Japan—and technology and skills are in longer supply than aid money in the industrial countries just now.

The need for capital in the capitalist economies is acute enough to guarantee a warm welcome for the newly rich beneficiaries of the oil cartel in the U.S., European, and Japanese investment markets—this, despite some predictable sensitivities of the sort engendered by much smaller Japanese overseas investments in recent years. One

prime sector for reinvestment of oil-earned dollars will ironically be the development of energy alternatives to Middle East crude.

Some monitoring of increased foreign investment in the United States will be in order, for example to avoid foreign control of key defense industries; but by and large, a requirement for full disclosure of new equity investments, plus the probable conservatism of investment policy on the part of the richest members of the cartel, should prevent the investments from getting out of hand in our enormous and flexible economy. Smaller industrial nations may need to keep a heavier hand on the importation of investment money as long as there is a big surplus of hard money chasing lucrative investment.

Even assuming a maximum attraction of Middle East earnings into appropriate capital investments, a sizeable fraction of the Middle East surpluses will have to be "invested" in debt paper which the purchaser recognizes to be, like a nuclear weapon, essentially unusable in day-to-day international intercourse. To help in this process, national governments and multilateral governmental organizations will increasingly have to intervene in the relationship with the newly rich. But there is meanwhile much that can be done, with the encouragement of governments, through the kind of mutual investment trusts suggested (in *Foreign Affairs* January 1975) by an international group of experts including Robert Roosa, a member of the Atlantic Council's Board of Directors.

The financial advisers to the oil producers analyzed skillfully what their cartelized strength could accomplish; their powers of analysis are certainly equal to the task of registering what a large stake they will have in the business health of the industrial nations, then deciding how much of the new earnings can be currently used—and then arranging to save the remainder in one form or another for the time being. There is recent precedent for such action by a creditor: the Federal Republic of Germany withheld the use of extra dollars it was earning on account of the presence in Germany of U.S. troops under NATO agreements.

The establishment of a demarcation line between usable and unusable earnings will require negotiation and agreement within a framework of new rules of the monetary game which the OPEC nations will have to be full partners in writing. For this purpose, the establishment of an International Energy Agency is only a first step in a structure for negotiations between the OECD and OPEC nations; a related financial coordination device on the side of the oil importers, working with financial authorities of the OPEC countries,

will also be required. The International Monetary Fund is well placed to serve as an independent facilitator in this new kind of bazaar.

The impact of OPEC prices is felt differently in different countries. Judging from 1974 experience, the stronger the economy *regardless of the degree of dependence on imported oil*, the better a nation can accommodate to the sudden change in the cost of energy. The balance-of-payments effect on Italy and Britain is serious; Germany and even Japan appear to be weathering the storm. A bold American proposal for a \$25 billion fund, announced by Secretary of State Kissinger in November 1974, would as a last resort redistribute the recycled petroearnings to help the weaker members of the OECD club. It is a welcome recognition that solidarity among the oil consumers has its price, too.

The new price of oil is most damaging of all, to the developing countries that have not found pools of energy underneath their national domains. What North America, Europe, and Japan can do—stop wasting energy, develop alternatives—is no answer to their problem. Their problem is that the new price-level for energy, together with the sympathetic inflation of other prices, including food, have essentially halted economic growth in the Asian subcontinent and some parts of Africa and Latin America, and they need a great deal of help.

There seems no alternative to large transfers of resources from the rich to the poor, along with the development of appropriate technologies needed for their own self-help. That sounds like the same old foreign-aid problem, but it is not. What is different this time is that the oil earnings extracted from the rich countries are potentially available as a new source of aid to the poorer developing countries—extra aid, which would not have been available through the political processes of the industrial nations, but which can now be “taxed” away from the rich oil consumers and given by the oil producers (or loaned on concessional terms) to the poor oil consumers.

Of course, most of this new kind of aid will be spent on newly expensive oil imports. Being rescued from disaster should not be confused with being helped to make progress in development.

So far, the oil producers are using their petroearnings only hesitantly, secretly, and most bilaterally to help their neighbors in the developing world. The recent large Saudi loan to the World Bank, and the 3.6 billion dollar “oil facility” at the IMF which channels oil-producer money into low-interest loans to oil consumers, are auguries of a better way. The best bet for the industrial countries is to build the capacity of the international institutions—the World Bank,

the International Development Association, the Asian Development Bank, the Inter-American Development Bank, the UN Development program, and for some purposes the International Monetary Fund—to serve as conduits for balance-of-payments help and development grants and loans from both the new rich and the older rich.

A good example, currently in negotiation, is the proposal suggested by Chancellor of the Exchequer Denis Healey for greatly expanded IMF facilities. That will mean cutting the newly rich in on the decision-making in these agencies, and overcoming the political ennui about aid that has overtaken electorates and legislators in some of the industrial nations including the United States.

IV

FIRST STEPS TOWARD COMMUNITY

The cartel succeeded in dominating the oil market for the obvious reason: the producers stayed together and the consumers are utterly dependent on what the producers had to sell—or withhold. The obvious antidote, for the consumers, was to get together on four kinds of cooperation—to build emergency stocks, to share the scarcity in the event of another embargo, to practice energy conservation in ways that would share the burden among them, and to search hard together for the best and quickest alternatives to Middle Eastern crude oil. In combination, these measures sooner or later might push down somewhat the relative price of oil; but if they did not, the measures would be all the more necessary.

After the early months of disarray, disunity, rhetoric and recriminations, European and American diplomats began quietly picking up the pieces. Starting with a Washington conference in February 1974, an international energy agreement, providing for its execution by an International Energy Agency, was negotiated and signed in September by representatives of eight of the nine partners of the European Community, the United States, Canada and Japan, subject to their varying “constitutional procedures.” France, which did not join, later agreed to cooperate on the understanding that a next step would be discussions with the OPEC countries. One striking feature of the agreement is a system of weighted voting which ensures that neither the United States nor Europe would have a majority; the decisions taken by weighted majority are matters deeply affecting the sovereign jurisdiction of the member States. Membership was left open-ended, to enable the French to change their minds and other oil consumers to join later—which several of them have done.

The agreement calls for proportionate reductions in consumption (10% of total energy used by each country) should an embargo or other emergency cause a shortage. This will have to be backed up by stockpiling arrangements which will be expensive: high-priced oil will have to be kept in high-priced storage facilities. The arrangement also provides a basis for allocation available oil (domestic production and continuing imports) to spread the shortfall equitably among the members.

Beyond this contingency planning, the agreement expresses (in Article 41) the determination of the participating countries "to reduce over the longer term their dependence on imported oil for meeting their total energy requirements." It continues that they "will undertake national programs and promote the adoption of cooperative programs, including as appropriate, the sharing of means and efforts, while concerting national policies, in the areas set out in Article 42."*

*Article 42

1. The Standing Group on Long Term Cooperation shall examine and report to the Management Committee on cooperative action. The following areas shall in particular be considered:

- (a) Conservation of energy, including cooperative programs on*
 - exchange of national experiences and information on energy conservation;*
 - ways and means for reducing the growth of energy consumption through conservation.*
- (b) Development of alternative sources of energy such as domestic oil, coal, natural gas, nuclear energy and hydroelectric power, including cooperative programs on*
 - exchange of information on such matters as resources, supply and demand, price and taxation;*
 - ways and means for reducing the growth of consumption of imported oil through the development of alternative sources of energy;*
 - concrete projects including jointly financed projects;*
 - criteria, quality objectives and standards for environmental protection.*
- (c) Energy research and development, including as a matter of priority cooperative programs on*
 - coal technology;*
 - solar energy;*
 - radioactive waste management;*
 - controlled thermonuclear fusion;*
 - production of hydrogen from water;*
 - nuclear safety;*
 - waste heat utilization;*
 - conservation of energy;*

The following article (Article 43) calls for a Management Committee to review by July 1, 1975, what the members have done, separately and together, to follow up with vigorous action on their commendably bold words. One thing the U.S. Congress can do right away about the energy crisis is to give this agreement its quick and unreluctant endorsement.

The International Energy Agency and the companion International Energy Program are well conceived. They will work if each nation is already doing its part. So far the United States, which suggested the formula for international cooperation, is not yet doing its national part. What is needed from the leading partner is a serious government-led energy conservation effort, and a maximum effort to bring into being as early as possible a variety of alternative energy sources.

V

LEADERSHIP FOR ENERGY CONSERVATION

The original formulation of Project Independence called for United States energy self-sufficiency by 1980. Later statements pushed the deadline off to 1985. Still later statements have referred to "the Eighties" or "later in the decade." The FEA's Project Independence Report, while it makes no recommendations as such, suggests as an option a definition of "independence" as "a situation in which the United States does import to meet some of its energy requirements, but only up to a point of 'acceptable' political and economic vulnerability." The Report does not quantify "acceptable."

-
- municipal and industrial waste utilization for energy conservation;
 - overall energy system analysis and general studies.

(d) Uranium enrichment, including programs

- to monitor developments in natural and enriched uranium supply;
 - to facilitate development of natural uranium resources and enrichment services;
 - to encourage such consultations as may be required to deal with international issues that may arise in relation to the expansion of enriched uranium supply;
 - to arrange for the requisite collection, analysis and dissemination of data related to the planning of enrichment services.
2. In examining the areas of cooperative action, the Standing Group shall take due account of ongoing activities elsewhere.
 3. Programs developed under paragraph 1 may be jointly financed. Such joint financing may take place in accordance with Article 64, paragraph 2.

It is not clear that a condition in which the United States is wholly self-sufficient and our main transatlantic and transpacific friends are very dependent on imports would be most likely to lead to effective international cooperation. Indeed, it is much more important to reduce Europe's and Japan's dependence on imports from sources liable to turn the oil flow on or off on political grounds, than it is to eliminate the last marginal barrel of American oil dependence. The U.S. is too dependent now; but it would be "acceptable" if it could reduce its oil imports to what it can conserve and supplant by planned emergency measures, not including reserve stocks, in a hurry (say within one year). It now imports more than one-third of its oil; that should be cut down to 10 or 15 percent at the most.

Even to meet this modest goal, and place ourselves in position to reduce energy (not just oil) demand by a further 10% in an emergency as called for by the International Energy Program (IEP), will require some actions which should be put into effect forthwith. Voluntary energy conservation can work only for a little while in the absence of strong continuing motivation such, for example, as cost. What is needed is a change in the structure of energy use that moves every individual, every industry, and every Government agency away from an assumption of cheap energy and toward an ethic of energy conservation.

A useful list of needed actions appeared in a recent statement by a group of knowledgeable citizens, including several directors of the Atlantic Council, which has appeared as a full-page newspaper advertisement (New York Times, December 27, 1974 and Washington Post, January 10, 1975).^{*} But the most important thing of all is for

**While there were differences of opinion both among the signers of the advertisement and within the Atlantic Council as to individual points, the list of actions given for reduction of consumption was:*

1. *Tariffs to limit oil imports.*
2. *Ceilings on oil imports.*
3. *Gasoline or fuel oil taxes to discourage oil consumption—with rebates, especially to the poor.*
4. *Increased taxes or annual license fees on those automobiles, appliances and other machines that use energy inefficiently. At the same time, tax credits or rebates could be made to those who purchase equipment that uses energy efficiently (such as automobiles that deliver high gasoline mileage).*
5. *Full disclosure of consumption efficiency with respect to all energy-consuming equipment.*

political leaders to take the problem seriously, to help create a climate of cooperation in which every citizen feels some sense of responsibility for cutting out unnecessary energy use. Recent polls suggest that the American people are considerably readier for this kind of sacrifice than their leaders give them credit for.

VI

LEADERSHIP FOR ENERGY ALTERNATIVES

Our overdependence on imported oil is the product of a supply-demand equation, biased by the artificial pricing of natural gas by government regulation. Conservation measures on the demand side can be supplemented (in time-scales ranging from a few months to two or three decades) by going to work on alternatives to oil-as-energy. A word is in order on each of the main options, for they all should find a place in a vigorous "alternative sources" policy.

Some of the options require not more research but a greater sense of urgency about *current issues of public policy*. For example:

- A decision to deregulate the price of previously discovered oil and natural gas, thus encouraging risk capital.
- A decision to encourage offshore exploratory drilling for petroleum and natural gas, by expediting offshore leases on the Atlantic Coast.
- A decision to encourage accelerated increase in coal supply by ending the moratorium on leasing of Western federal coal reserves.
- Decision on the trade-off between environmental concerns for the restoration of surface mined lands and the need expeditiously to enfranchise our reserves of Western coal mineable only by surface methods.

-
6. *Vigorous enforcement of the 55-mile-an-hour speed limit.*
 7. *Minimum efficiency standards for equipment that uses significant amounts of energy, phased in over several years.*
 8. *A system of energy rates to penalize the use of wasteful amounts of energy.*
 9. *Temperature and lighting standards that could be reasonably enforced without unduly intruding into the private lives of our citizens.*
 10. *Subsidies for low-income citizens (and temporary tax credits for others) to stimulate investments in insulation and energy-saving equipment.*
 11. *A comprehensive program to determine the extent to which energy should be saved by the readjustment or temporary postponement of environmental programs (such as emission controls).*

- The installation of hydroelectric turbo-generators in facilities already built.
- The funding and construction of undeveloped hydroelectric sites, already identified and studied by the Corps of Engineers.

The squeeze on imported oil happens to coincide with a slow-down in the expected rate of development of *nuclear fission* as a major alternative source of energy. There seem to be three kinds of trouble: public opposition to particular sites and public distrust of announced safeguards; some technical problems in the operation of reactors; and escalating construction costs, combined with a shortage of capital, which have caused the cancellation or postponement of construction plans. The problems are not insoluble, but the Government's role must move beyond mediating between contending groups to taking the responsibility for making the controversial decisions that will get nuclear energy produced—even if that means the government goes to some degree into the production business.

The most important near-term alternative to oil is *coal*. At present rates of use, proven United States oil and gas resources would last a decade or so; coal reserves will last a century or more. Coal now accounts for 19% of our energy budget. Giving coal the role it should play in our energy budget—at least double today's output—involves: (a) increasing its use as a boiler fuel, especially for the production of electricity, and (b) finding the best way to produce synthetic natural gas and synthetic liquid fuels from coal.

The problem in extending the use of coal for burning is essentially an environmental one—potential harm to the area from which it is dug, to the people who do the digging, and to the air that receives the after-burning wastes. A Government program that tackles these issues squarely, rather than just refereeing arguments between the coal producers/users and the environmentalists, is urgently required.

Synthetics from coal still require research-and-development investment of major proportions, and are not likely to be significant substitutes for imported oil until the early 1980s. But it will be important to focus major scientific and engineering know-how on the selection of optimum processes very soon, to make sure that synthetic fuels based on coal, including methanol, do become available in the early 1980s. In the meantime, Federal underwriting of *demonstration* plants for synthetic gas and liquid fuels from coal, which still must be mined, would be good policy, and necessary insurance, however the international negotiations about price and dependability of imported crude oil turn out.

A comparable collection of technical and environmental problems faces the production of usable *fuel from shale and tar sands*. Disrup-

tion of the land surface (sometimes in areas of spectacular Western scenery), pollution from refining processes, disposal of wastes, water supply and other problems make it easy to write off these potential sources of North American "oil". But any national energy policy which means business should actively try to find environmentally acceptable ways to take advantage of these energy-rich resources, as alternatives to vulnerable imports from undependable sources.

In the longer run, the energy that would be both environmentally clean and politically invulnerable is *nuclear fusion*. Conventional wisdom holds that fusion may be important in the 21st century, but not earlier. Recent experiments with laser-produced neutrons suggest that there may be a potential breakthrough that would considerably advance the time at which fusion power could be substituted for other kinds of energy. The long-range importance of this option is such that a major investment of Government effort, along the lines of the Manhattan project or the Polaris program, is surely justified.

Natural energy is a much publicized alternative to fossil fuels. There is an assortment of possibilities. Geothermal energy will certainly be important in localities where volcanic heat (hot rock or steam, or eventually the molten rock itself) can be tapped; whether geothermal will have more than local relevance may depend on new ways of converting the energy into transportable form. The use of winds and tides, and the conversion to usable energy of the temperature difference ("delta-T") between the colder deeper water and the warmer water near the ocean's surface, are also limited to local distribution until transportable units of power other than fossil fuels and uranium have been proven feasible.

The most "natural" form of energy is the direct use of the sun, especially in the tropics where the sun shines on the earth's surface most of the time. The sun's rays have been used to power space vehicles, at unit costs which would be prohibitive for most earth-bound purposes; but further research might develop ways of using the sun directly for the solution of the earth's energy shortage. Solar energy is a dependable resource which is available to all parts of the world without political discrimination, and is especially available to those regions which happen to be the poorest. Along with power from nuclear fusion, the widespread use of solar energy should be a very high-priority object of Government-sponsored research and development.

Except for the burning of coal, many of the alternatives to petroleum are likely to be high-cost compared to the cost of production of crude in the Persian Gulf. A program designed to bring into practical use sources of energy other than oil may itself be vulnerable to

decisions by the oil producers' cartel to lower the price of Middle Eastern oil. We believe that it would be worthwhile to see whether a long-term arrangement can be made with the cartel for the guaranteed delivery of lower-priced crude oil for a period of years ahead. In the likely event that such an agreement is not negotiable soon, we believe the United States should commit itself to development of the alternative and exotic sources of energy mentioned above, and plan to subsidize the development or protect the sale of other forms of energy to the extent necessary to offset any later decrease in the price of Middle Eastern crude oil.

VII

A SPECIAL KIND OF LEADERSHIP: SUMMARY AND RECOMMENDATIONS

In sum, the world energy predicament "is grave but it is soluble." Part of the solution is effective and continuous dialogue between the oil producers and the oil consumers in the spirit suggested by a study of *Energy Prospects to 1985*, published this week by the Organization for Economic Cooperation and Development:

The complementarity of interests between OECD and OPEC countries (the former seeking to reduce their dependence on imported crude oil and the latter to diversify their economies from dependence on the same commodity) indicates that the world economy has more to gain by cooperation than by competition between the two groups. Such cooperation is likely to be more effective if the OECD countries can achieve an effective cohesion in the field of energy.

The key to both of these international imperatives—cohesion among the industrial countries, and eliciting the cooperation of the oil producers—is what the United States does about its own energy problems.

It is only against the backdrop of an *action* program by the United States that this nation can give effective leadership to the joint effort of the major oil importing nations envisaged by the Presidents of the United States and the French Republic in their December meeting of Martinique.

There—in the Communiqué following the meeting:

"They recognized the importance for the USA, the EEC and other industrialized nations of implementing policies for the conservation of energy, the development of existing and alternative sources of energy, and the setting up of new mechanisms of finan-

cial solidarity. They stressed the importance of solidarity among oil importing nations on these issues."

It is only against the backdrop of an *action* program that the major oil consuming nations, led by the United States, can expect to initiate fruitful multilateral negotiations with the oil producing countries—with OPEC—with the cartel.

This was also properly emphasized at Martinique. The communique stated:

"Based on substantial progress in the foregoing areas, the Presidents agreed that it will be desirable to propose holding a preparatory meeting between consumers and producers to develop an agenda and procedures for a consumer/producer conference. The target date for such a preparatory meeting should be March 1975.

"The preparatory discussions will be followed by intensive consultations among consumer countries in order to prepare positions for the conference."

Time is short. No more important and delicate series of international negotiations ever challenged the leaders of nations. Skill, fairness and dispatch are at a premium.

The agenda for negotiations between oil producing and consuming countries should envisage the conclusion of international undertakings that provide economic and financial *quid pro quos* that are attractive and equitable for all affected.

The agenda must not be limited to collaborative arrangements for financing the balance of payments deficits induced by essential oil imports that will minimize the disruption to the world trade and payments system, to economic growth in the industrialized nations, and to the continued development of the poorer countries, however fundamental and immediate the effective recycling of petrodollars may be to these common goals.

The agenda must also address the restoration of a better equilibrium in the balances of trade between oil producing nations and oil consuming nations. That is the only ultimately satisfactory solution. "Recycling" devices, however temporarily effective, only buy limited amounts of time for the adjustment process to work, while huge transfers of wealth are made from oil consuming to oil producing countries, accompanied necessarily in many cases by the accumulation of a huge overhang of unrepayable debt that is a threat to a viable world economy.

There are two main paths to the restoration of a better equilibrium in the balance of trade—a lower price for crude oil exports and/or the more rapid increase and absorption of goods and services by the oil producing countries from the oil consuming countries.

The negotiation of a lower price for crude oil that is fair to the producers, but will also permit an earlier achievement of a better equilibrium in the balance of trade, of long-run advantage to consumer and producer alike, should be high on the agenda. But it, too, must not stand alone.

The agenda must include a consideration of organized national and international effort to maximize the flow of goods and services from the oil consuming countries to the oil producing countries. This movement will also serve to promote a better trade balance earlier and reduce the magnitude of the duration of the financing problem.

This effort can also serve, if properly designed, to enable the oil producing countries (a) to diversify their economies so as to reduce their national dependence on an exhausting resource and (b) to convert this resource into tangible material benefits for their people.

Trade with and development of the oil producing countries deserve as much emphasis as the recycling of their surpluses that flow from the sale of oil or the negotiation of a lower price.

Mindful of these imperatives for timely U.S. leadership in meeting the world energy problem and preserving the fruitful interdependence that a quarter century of intensive international cooperation has brought to democratic industrialized societies and developing countries alike, we urgently recommend to the President and to Congress a six-point action program:

1. The Administration and Congress should arrange to quickly confirm, and enact the legislation necessary to implement, the International Energy Agreement signed in Paris in November 1974 by eight of the nine members of the European Community, Japan, Canada, and the United States and subsequently by Austria, Spain, Switzerland, Sweden and Turkey.

2. The United States should take the lead in fashioning arrangements that help the OPEC countries invest as much as possible of their surplus oil earnings wisely in both the "industrial" and the "developing" worlds—and with equal wisdom agree to save the rest. As it did with the International Energy Agency, the United States should take the lead in pulling the industrial nations together to negotiate with the newly rich oil producers the new rules of a fast-changing financial and monetary system.

3. The United States should show that it is serious about energy conservation. That requires a strong lead from the national Administration and the Congress. A number of obvious and much-researched measures await political decisions for which people are readier than their leaders apparently believe. Among them are inducements for the more efficient use of energy by industries; direct taxes on the use

of petroleum products; a graduated tax on automobile horsepower, auto speed limits, building-code adjustments; penalties for industrial energy waste. Even more important than the particular measures is the climate of cooperation that unleashes the ingenuity of an ingenious citizenry to save energy in dozens of ways that can add up to millions of barrels of imported oil we don't need.

4. The United States, which has the most energy supply options, should take the lead in finding practical substitutes for Middle Eastern oil—not just short-run or just long-run, but both with an equal sense of urgency. This means:

- Deregulating previously discovered oil and natural gas, opening federal coal lands to leasing, getting on with offshore exploration for oil, and stepping up the priority of existing and identified hydro-electric sites.

- Taking a more active hand in sorting out the issues that have slowed the development of energy from nuclear fission.

- Accelerated use of more coal to make electricity.

- Working hard to exploit oil from shale and tar sands in environmentally acceptable ways.

- Bringing the long-range nearer faster with a very high priority government-sponsored push (seriously comparable to the Manhattan project or the Polaris system) on the production of clean energy from nuclear fusion and from "natural" sources including solar energy.

5. The Administration and Congress should arrange urgently to concentrate in a single all powerful agency reporting directly to the President, all of the government's authority to act on production of energy, whether through changes in the economic and legal climate to accelerate investment, expedited regulatory decision-making, or direct action by government. What is needed in Washington is the organization of the Federal government to assure the availability of enough energy to satisfy our national needs and our national interest in international energy cooperation and avoid inadequacy of energy supply whether threatened by the pluralistic processes of the market place, divided authority in public regulation, or action by the oil producers' cartel.

6. Development of monetary and fiscal policies and an investment climate which will make possible an estimated flow of at least \$50 billion a year into investment required for additional energy resources in the United States. This means large new savings and inducements to invest in this rather than in competing fields. The Atlantic Council is preparing further analyses and recommendations on this subject for issuance soon.

The long era of cheap energy is suddenly over. The resulting "energy crisis," partly acute and partly chronic, requires a special kind of leadership in the industrial democracies, and especially in the United States of America.

The crisis is analogous to wartime precedents, in that effective action requires *both* a wide popular consensus in diagnosing the disease and prescribing remedies, *and* a great pluralism of remedial actions—by business managers, business investors, labor unions, consumers, and government agencies. The crisis that produced the Marshall Plan required decisive action primarily by legislatures and government office-holders. The contemporary energy crisis, like industrial mobilization in World War II and the Korean war, will require actions by dozens of government agencies, thousands of private institutions, and millions of householders and automobile owners.

The quality of leadership required in these circumstances is very special—not just the capacity to guide legislation through the labyrinth of enactment, but the capacity to educate whole populations to understanding that modern interdependence and national security require changes in lifestyles and workways—and to elicit millions of willing actions, more or less voluntary, backed up by the market economy, social pressure, public shame and at the margin by governmental enforcement.

Such leadership within nations, and especially within the United States, is essential to the fashioning of international arrangements that will enable the oil consumers to negotiate effectively with the oil producers—and induce them both to pay due attention to the plight of the Fourth-World oil-consuming developing nations.

Members of the Atlantic Council Energy Steering Committee

Chairman:

Henry H. Fowler

Rapporteur:

Harlan Cleveland

Members:

Theodore C. Achilles
 Charles F. Adams
 W. Randolph Burgess
 John Campbell
 Emilio Collado
 Sherwood L. Fawcett
 John P. Fishwick
 John E. Gray
 Joseph W. Harned
 Parker T. Hart
 Peter Hofmann
 John E. Kircher
 Tom Killefer

Walter J. Levy
 William McC. Martin
 Cecil J. Olmstead
 Taylor Ostrander
 David Packard
 Hoyt Price
 Simon Ramo
 Sidney E. Rolfe
 Robert V. Roosa
 Philip N. Ross
 Nathaniel Samuels
 E. Keith Thompson

ENERGY SERIES

The Atlantic Council
of the United States

Policy Papers

Financing Free World Energy Supply and Use

by John E. Gray
Foreword by Henry H. Fowler

PRE-PRINTED FROM
The Atlantic Community Quarterly

THE ATLANTIC COUNCIL OF THE UNITED STATES

The Atlantic Council, established fourteen years ago, has as its prime goal to contribute to better relations among the countries of North America, Western Europe and Japan. These varied and complex relationships have been and will continue to be central to the major economic and political developments which affect our international integrity and domestic well-being.

In an increasingly interdependent world where "foreign" policy is ever more closely intertwined with "domestic" policies, there is a clear need for both official and private consideration of means of dealing with problems which transcend national frontiers. The Atlantic Council is a unique non-governmental, non-partisan, tax-exempt, educational, citizens' organization. It conducts its programs to promote better understanding of major international security, political and economic problems, foster informed public debate on these issues, and make substantive policy recommendations to both the administrative and legislative branches of the U.S. Government, as well as to the appropriate key international organizations.

The Board of Directors of the Atlantic Council is composed of some one hundred prominent leaders and experts in business, finance, labor and education, together with former senior government officials. Their names are listed on the back cover.

Also published in the POLICY PAPERS Energy Series:
World Energy and U.S. Leadership, by Harlan Cleveland.

Additional copies of POLICY PAPERS may be ordered at \$2.50 each from:

The Atlantic Council of the United States
1616 H Street, NW
Washington, DC 20006

Financing Free World Energy Supply and Use

Table of Contents

	<i>Pages</i>
Henry H. Fowler's Foreword	iii
Introduction	1
Approach of this Paper	2
Demand and Supply Estimates	2
Demand and Supply—Summary of Estimates	3
Reducing Demand	3
Supply Options	5
The Impact of R&D on Capital Requirements for Supply	8
Impact of Social Costs on Capital Requirements for Supply	10
The Magnitude of Capital Requirements	11
The Magnitude of Financing of Imports	12
Financing of Capital Requirements and Imports	12
Financing Energy from Conventional Sources	13
Financing Energy from Non-Conventional Sources	15
Financing Energy Imports	16
Impact of OPEC Price Increases on the U.S.	17
OPEC, OECD and Financing the LDC's	19
<i>Conclusions and Recommendations for the U.S.</i>	19
"About the Author"	25
Tables (I through XII)	27

FOREWORD

In January of 1974, the Atlantic Council established an Energy Policy Committee to consider the problems of national coordination and international cooperation in the field of energy. During the second half of the year, three task forces carried out detailed inquiries into the financing of energy supplies, alternatives to imported oil and gas, and accelerated development of these and other conventional energy resources.

The year just past has seen an extraordinary outpouring of facts and forecasts, news and opinion, options and scenarios about the interlocked complications that make up the "world energy problem". Major reports have issued during 1974 from the Ford Foundation, the Committee for Economic Development, the Trilateral Commission, and the Federal Energy Administration (on "Project Independence"), as well as two previous policy papers from the Atlantic Council. In January the President reported his Executive actions and legislative recommendations to Congress and to the nation. The Atlantic Council task groups have also been able to draw on a massive international compendium of statistics and analysis by the Organization for Economic Cooperation and Development. Important additions to this literature have come from Legislative hearings as well as Executive speeches, and from journals, weekly newsmagazines and daily newspapers.

It is clear that the abrupt ending of the era of cheap energy and concomitant changes in the financial situation of many nations constitute not only serious dangers for the world's trade and payments systems but also for the cohesion of the democratic industrialized nations upon which their security and prosperity depend. As the basic purpose of the Atlantic Council is to contribute toward more effective cooperation and cohesion between these countries, the present situation is naturally of concern to it.

Another scholarly research report would be redundant. But the Atlantic Council's mode of work is not basic research; it is policy analysis. Our purpose here is to suggest the framework of U.S. action which would best reflect and express the interdependence of U.S. decisions with those of other nations, especially our closest allies in the "Community" of industrial countries which now extends across the Pacific as well as the Atlantic.

I take pleasure in presenting herewith a paper by John E. Gray for

the Council's Committee on Energy. This paper has been written in the light of the discussion of the Committee and its Working Groups. While the final responsibility for the views expressed is that of the author, the Council is pleased to present them for public discussion and debate.

Members of the Energy Committee are listed on the inside back cover.

Henry H. Fowler
Chairman

Financing Free World Energy Supply and Use

By John E. Gray

INTRODUCTION

Today's energy supply problem is oil, necessary for Europe and Japan to function, for the U.S. not to be extremely hard-pressed, and for the LDC's¹ to survive. The dominant issues are the availability and cost of oil and difficulties and dislocations involved in paying for oil at current prices. Moreover, oil supply and associated financial problems must be considered and resolved in the context of the combined Free World energy supply and financing capabilities, and its interwoven domestic and international economic, political and monetary problems.

Since OPEC² oil has been and remains the primary marginal energy supply of the OECD³ area, today's problem is to preclude OPEC oil supply and price from continuing as the intractable factor dominating the OECD countries energy decision-making. Tomorrow's solution lies in making available sufficient dependable energy supply of all forms from OECD controlled resources, thus reducing the dependence on oil from OPEC nations on terms which do not involve unfair advantage to either buyer or seller. This ability to be independent of OPEC dominance in energy supply could bring with it the future ability to depend on individual OPEC countries for limited oil supply on mutually agreeable terms.

There are practical supply options. Their range is broad. Some are explored herein. All supply options require significant changes and improvements in allocation of financial resources and improved allocation mechanisms. Financing is the dominant problem and constraint in three related areas: (1) production of conventional supply, (2) development of non-conventional supply, and (3) imports, especially oil.

¹*Less Developed Countries*

²*Organization of Petroleum Exporting Countries, principally: Mid-East countries, Venezuela, Nigeria, Indonesia, Ecuador.*

³*Organization for Economic Cooperation and Development, includes the United States and Canada, Western Europe, Japan, Australia and New Zealand.*

APPROACH OF THIS PAPER

This paper deals primarily with the problems involved in financing and providing energy supply in the U.S. and other OECD countries of Western Europe and Japan. Demand and supply assumptions dictate the magnitude and character of the financing problem, and perhaps the solution, and are dealt with briefly to indicate their influence. It is presumed that manageability of financing will govern all actual demand and supply decisions. It is further presumed that demand and supply ambitions must quickly be based on prudent energy use and financial management by all buyers and sellers. Other factors influencing demand, supply and capital requirements are touched on.

We first set forth estimates of demand and supply for the U.S. separately and for the OECD countries including the U.S. These estimates suggest the impact of the October, 1973 oil supply interruption and subsequent price increases on both demand and on supply strategies. Then we briefly consider:

- Reducing demand
- Supply options
- The impact of R&D on capital requirements for supply
- The impact of social costs on capital requirements for supply
- The magnitude of capital requirements
- Financing of "conventional" supply (oil, natural gas, coal, nuclear, hydro)
- Financing of "non-conventional" supply (coal gasification and liquefaction, shale oil, tar sands, geothermal, etc.)
- Financing of imports

We finally draw some conclusions and make limited recommendations for U.S. Government policies and actions, considering both domestic and international energy supply and financing. U.S. domestic policies and actions are emphasized as they are necessary precursors to the United States' providing leadership and effective assistance in the international arena.

DEMAND AND SUPPLY ESTIMATES

In Tables I through V, appended, we present a set of estimates⁴

⁴*Derived from Energy Prospects to 1985 (Paris, OECD, January 1975). The OECD data in turn are derived from a wide country by country collection of data. OECD, and the author, caution that because of large uncertainties which cloud the energy supply and demand picture, all of the estimates in this paper should be regarded as highly speculative. Their accuracy depends in large measure on policies and actions not yet firmed up, in addition to the inevitable vagaries of the future.*

prepared for use in exploring policy issues. They show overall energy supply, imports and consumption for the entire OECD area, and separately for the U.S., in 1980 and 1985—for oil at \$7.20 a barrel and at \$10.80 a barrel (both in 1974 dollars) compared with a base projection (pre-October 1973) forecast, and with historical data for 1972.

The trends suggested are more significant than the magnitude of the values set forth and are discussed below.

DEMAND AND SUPPLY—SUMMARY OF ESTIMATES

For our current purpose we need only note the following—for all of the OECD countries—from Tables I and II.

For 1980, total primary energy supply is 5.6% *less* than the 'pre-October 73' estimate, indigenous supply is 11.6% *more*, and imports are 27.8% *less* than 'pre October 73' trends—for the \$7.20 oil case. Corresponding figures for the \$10.80 oil case are indigenous supply 19.1% *more*, imports 45.8% *less*.

For 1985, total primary energy supply is 7.1% *less* than the 'pre October 73' estimate, indigenous supply is 25% *more* and imports are 41% *less* than 'pre October 73' trends—for the \$7.20 case. Corresponding figures for the \$10.80 case are 34.8% *more* and 61.5% *less*.

The trends suggested involve less use (conservation) of energy, increased use of indigenous coal, oil and gas, increased use of uranium, increased use of electricity, and markedly decreased use of imported oil and gas.

Estimates for the U.S. only are presented in Tables III, IV and V. The same trends are suggested, amplified by the presumption of U.S. exploitation of its more favorable indigenous resource base.

Table VI presents estimates of the reduction in average annual energy consumption growth rates associated with the \$7.20 and \$10.80 cases. For all OECD countries it drops from a 'pre October 73' estimate of 4.9% to 4.1% for the \$7.20 case and 3.6% for the \$10.80 case—for the 1972-1980 period. The corresponding figures for the 1972-1985 period are slightly higher—4.3% and 3.8%. The U.S. alone is estimated to drop from 3.7% to 3% for the \$7.20 case and to 2.5% for the \$10.80 case—for the period of 1972-1980.

REDUCING DEMAND

Most of the estimated reduction in demand shown in Tables I-VI results from presumed decreases in use due to increases in price. The historic correlation between energy demand and GNP suggests that continued economic growth requires continued growth in energy supply *or* more efficient use of energy. We have yet to understand the longer term impact of the dramatic increases in price of energy on

demand except to presume that *all* buyers of energy will be ever more sensitive to its use. This sensitivity to price is apparently influencing use habits and patterns in the short term and will exert far-reaching influences in the longer term—especially where specific end uses and larger energy use systems must change more slowly, as in existing industrial and transportation consumption.

There is worldwide emphasis on energy conservation as an ethic, and great current dependence on conservation by governments, and energy suppliers, to exert some downward pressure on demand because at the past price level there were no medium term scarcity constraints. However, the only lasting factor which dictates conservation is scarcity of supply relative to current and future demand. The market will equilibrate the two now and in the future if allowed (or caused) to do so. Therefore, a most important factor which can contribute to reducing current demand and establishing sustainable future demand is prices which reflect all costs including: long-term resource exploration, development and production; environmental and health and safety protection; other externalities, of whatever character, which can be internalized⁵; and adequate profits. In the instance of government energy supply institutions (e.g. TVA) revenues must be adequate to cover the same basic costs and produce reserves sufficient to assure their financial viability.

Accelerated reduction of current demand (for anything) can result from taxes designed to accomplish specific reductions. Demand can also be “managed” by arbitrary restrictions on supply, or on use. These should be regarded as measures to be applied most carefully. Unless paralleled by actions which increase supply (including alternates) to offset shortages, forced conservation could be a dreadfully misleading short term palliative. Market equilibrated conservation is a long term solution.

Any forced conservation measures should be coordinated with national planning and decision-making clearly directed toward providing alternate supply (or permanently reducing the specific demand) sufficient to support a return to market determined use of energy. Recommendations are made to that end.

Finally, it should be recognized that conservation also has its financial requirements. It has been estimated, in a 1974 U.S. FEA study, that based on a reference projection of total U.S. energy de-

⁵ *This is a mechanism which allows and requires the harmonizing of industry's and society's interests. Societal dictates become quantifiable industry objectives and obligations, with industry perceiving and capturing all of the costs and benefits involved in acting to achieve them.*

mand in 1985 of 117×10^{15} BTU's (2950 Mtoe) energy savings of 9% could be achieved by a given combination of increases in efficiency in the various sectors with a cumulative investment between 1974 and 1985 of \$88 billion in 1973 dollars. To save 22% in overall consumption the cumulative investment would be \$307 billion. Corresponding preliminary estimates⁶ for the OECD countries indicate that investments in energy conservation could reach \$330 billion with 15% conservation (and \$510 billion at the 20% level), over a period of 10 years.

SUPPLY OPTIONS

There are solid options to be considered in providing energy supply to meet the various demands embraced by the residential, commercial, industrial and transportation use categories. First, we recognize the current extent of substitutability of oil, gas and coal and derivatives of coal for each other; the current extent of the substitutability of electricity for oil, gas and coal in end use; and our current ability to use oil, gas, coal and hydro and uranium for the generation of electricity. Further, we recognize the relative efficiencies in use of energy resources which pertain to entire systems (such as space heating and transportation)—from raw BTU's to end use. These "recognitions" are vital factors in supplier and consumer planning on energy supply and use.

Desirable supply scenarios vary with each OECD country's indigenous resource base and plan regarding continued need for or dependence on imports.

An option with broad appeal involves major increases in supply and use of electricity, and substituting electricity in end use for gas and oil, where technologically and economically feasible. The thrust of this option, with variations as to the relative use of nuclear and fossil fuels available to them, has recently become an important component of the de facto emerging long term energy policy of the European Community and Japan.

In the Spring of 1974, France developed and announced its plan to accelerate the supply and use of electricity. M. Delouvrier, of Electricité de France, more recently⁷ summarized his related views as follows:

⁶From Energy Prospects to 1985, OECD, January 1975. Estimates in 1972 dollars.

⁷December 8, 1974, "Remarks On the Energy Problem," before the Trilateral Commission.

"There is no reason to expect a substantial reduction in oil prices. There is no prospect of one before the 1980's, when nuclear energy (producing electricity) and new oil fields outside the Middle East can begin to make a massive impact on the energy balance. Even subsequently, major price reductions are unlikely since a relatively high price will make it possible to maintain, on the one hand, the oil reserves of the producers and, on the other, the competitive capacity of oil fields which are more difficult to prospect and develop than those of the Middle East, and of substitute fuels such as tar sands, oil shale, coal gasification, geothermal or solar energy, etc."

The case for adopting massive electrification for the U.S. is found in a recent paper⁸ titled "Accelerating U.S. Supply and Use of Electricity":

- Increase in supply and use of electricity in the U.S. has been a pervasive historic trend for reasons of economy, versatility and reliability.

- Acceleration of this trend, using nuclear fuel and coal to generate electricity, provides the opportunity to:

- cut back on U.S. oil and gas requirements and associated international supply, political and monetary problems.

- develop a U.S. energy policy and supply based on resources and decision-making under U.S. control.

- use all U.S. controlled energy resources more efficiently.

- By 1985, annual U.S. savings⁹ in use of oil and gas could amount to:

- Gas—7.0 quadrillion BTU (6.8 trillion cubic feet)

- Oil—14.0 quadrillion BTU (2.5 billion barrels, or 6.8 million barrels per day).

- By the year 2000, the annual savings⁹ are more than twice the 1985 savings⁹

⁸By John E. Gray, for FEA, October 13, 1974. Data updated January '75. The paper deals with supply consideration; institutional, technological, financing and constraints on constructing generation, transmission and coal and uranium production and use. It also considers the changes in energy use patterns and the capacity of U.S. industry and government to plan and carry out an accelerated electrification program.

⁹Compared with reference "normal" increase in use of electricity associated with annual growth of 5.6% and 4.73% respectively; and 3.6% and 2.1% for the same periods for all energy growth. "Savings" include both reduced use resulting from substitution of electricity and conservation. Also, for reference, the 1974 demand for oil is about 17 million barrels per day and for gas about 23 trillion cubic feet.

- An accelerated electricity supply program is feasible with adequate financing and government/industry cooperation and coordination in setting goals and decision-making.

- An accelerated electricity use program is feasible—with encouragement, education, and forcing incentives in the residential, commercial, industrial and transportation sectors.

Again, we are dealing with trends. This one is interesting because it represents a continuing historic trend¹⁰, and relates to what could probably be done in the U.S. by U.S. industry with U.S. resources, albeit only if allowed to within a framework of encouraging and permissive U.S. Government policy and regulation.

In the referenced paper the benefits of accelerating the supply and use of electricity, using nuclear and coal fired plants, are further set forth as providing the opportunities to:

- Have a reliable, versatile, economic U.S. energy supply.
- Phase out the use of oil and gas for generation of electricity.
- Substitute electricity for oil and gas in many of their end use energy applications.
- Provide earliest and maximum U.S. long term independence of interruptible and/or high cost imported oil and gas.
- Develop a reliable and economic U.S. energy supply based on policies and programs dependent solely on U.S. decision-making and energy resources under U.S. control.
- Develop U.S. energy policy compatible with pre-existing electrification supply and use trends *and* with the new realities of oil and gas supply, as well as conservation and environmental requirements.
- Encourage use of an energy form which in most applications is desirable for reasons of economy, efficiency, versatility and reliability.
- Encourage use of an energy form which in many major applications, such as heating and some forms of transportation, can be more efficient in the use of energy resources (BTU's) than alternate energy sources (i.e. the efficiency losses in generating electricity are more than offset by the higher efficiency in the end use resulting from the use of electricity, presuming correct end use).
- Use currently established institutions, technology and capabil-

¹⁰In 1973, 26% of all primary energy used in the U.S. was converted to electricity. 1973 (pre-oil crisis) estimates were that by the year 2000 from 50 to 65% of all primary energy used in the U.S. would be used in the form of electricity.

ities which are sufficient to quickly accelerate electricity supply and use.

- Develop and incorporate into an ongoing program alternate energy sources—fusion, solar, geothermal, tides, winds, etc., as these sources are developed and can contribute economically to the generation of electricity.
- Conserve remaining U.S. oil and gas reserves for uses in which they have unique value—some transportation (including fewer, higher efficiency automobiles; airplanes and trucks); some electric generation (such as very low load factor peaking plants); and products such as fertilizers, petrochemicals, plastics, drugs, etc.

Table VII¹¹ provides a comparison of the prospective use of electricity expected from “normal” (pre October 73, oil crisis) increase in use, and prospective accelerated use, as well as a summary of the effect on fuel requirements. Further detail on end use substitutability is found in Table VIII¹¹.

The estimated capital requirements for the “normal” and accelerated approach to use of electricity are of interest. See Table IX¹¹. Note that the substantially increased capital requirements for the accelerated electricity case are estimated to be offset by savings in costs (of the “substituted for” end use energy forms—oil and gas) over the period.

THE IMPACT OF R&D ON CAPITAL REQUIREMENTS FOR SUPPLY

Technology is now available to sustain the commercially viable finding and production, and use, of crude oil, gas, coal and uranium either directly or in the generation of electricity. There are large continuing research and development efforts carried out principally by the private and public energy supply industry (with major U.S. Government assistance on nuclear and minor assistance on coal). These efforts are directed toward improving the efficiency and economics of existing operations in the energy supply and use systems, or in adding new operations closely related to the existing systems. Collectively, these can keep the 1974-85 energy supply system financing requirements from being much higher than they otherwise would be. They also can materially assist in the adjustment to greater use of coal and uranium relative to oil and gas.

¹¹From John E. Gray Report for FEA, October 13, 1974. Based on data then provided by Westinghouse Electric Corporation and subsequently updated, on January 19, 1975. The updated data are included in the Tables of this paper.

Investments in gasification and liquefaction of coal, and oil from shale all require or are sensitive to technological developments not yet reduced to large scale commercial practice. These investments, as well as the availability of precursor research and development funds (especially from the private sector) are even more sensitive to market price for the prospective supply. However, these sources at best represent only a very small part of the presumed energy supply during the 1974-85 period. Consequently, while developing and financing the new alternative or non-conventional supply activities could, if justified by the market or government intervention, require some billions of dollars during the period, this will represent a small percentage of the total capital required.

Development of breeder reactors, geothermal, fusion, hydrogen production and use, extensive use of solar energy and other new technologies are expected to soak up large amounts of R&D dollars during the 1974-85 period, but are *not* expected to generate significant candidate commercial ventures (private or public) that would justify major capital investment during the period.

In discussing R&D in this paper, we attempt to put it in perspective as it impacts on capital requirements during the 1974-85 period. We also endeavor to dismiss the premise that we can somehow "R&D ourselves out of" having to face the large and intractable physical and financial resource commitments required to sustain the OECD countries' energy supply requirements. We are in a sense committed to doing better what we already know how to do on an economic basis. We seek easier, and perhaps more desirable ways to supply and use energy. Until they are accepted as being economically viable, by whatever future measures pertain, we continue to be limited to doing what we know how to do.¹² This results in the large physical resource and financial requirements set forth elsewhere in this paper.

Some perspectives about the relationship of research and development to energy supply and use and financial requirements are offered as follows:

- Industry R&D investments *tend to reduce* capital requirements per unit of output, or *tend to restrain* increases in capital requirements per unit of output as lower grade or less accessible resources are developed.
- Industry R&D investment also results in introduction of new mar-

¹²A reviewer suggests that although the energy industry is efficient, it does not operate at the frontiers of technology, management and resource allocation.

ginal supply in lieu of older higher recovery or production cost supply.

- Government funding increases the capacity of industry to assume greater risks than it otherwise would on projects which are of interest to the government and/or the industry.
- To the extent that government R&D funds can be packaged into energy industry supply oriented development work, those funds can be expected to have the same *character* of impact on financial requirements.
- Government R&D, conducted absent the discipline of commercial orientation, *tends to be unrelated* to market oriented decisions regarding capital investment in energy supply and use activities.
- To the extent that Government energy R&D funds are committed and managed without the influence of market oriented decision-making, those funds are unlikely to have any clear impact on financial requirements (or anything else).

In summary, R&D which is competently conducted and related to the market system which governs energy supply and use decisions (by public and private supply companies and by residential, commercial, industrial and transportation consumers) is likely to have a marked favorable downward pressure on capital requirements. These thoughts in no way argue against long-range, currently non-market related, government or industry supported R&D which is beyond the capacity of the market to internalize on a current basis.

IMPACT OF SOCIAL COSTS ON CAPITAL REQUIREMENTS FOR SUPPLY

It is suggested¹³ that the costs of all pollution control may be 1% of GNP (or slightly less) for the OECD countries studied for the 1971-75 period (Japan being an important exception at something like 4%) rising to between 1 and 2% for the U.S., Italy and the Netherlands in the second half of the decade.

In this paper we suggest that current trends in the U.S. may be resulting in additional financing costs required to accommodate environmental and health and safety regulation on the order of 25-40%¹⁴ in the electric power generation field and 10-15%¹⁴ in other conventional energy supply operations. Electric power generation and transmission is estimated to require one-half of all new energy capital requirements in the U.S. in the 1974-85 period. TVA earlier estimated that "social costs" could double the cost of electricity on its system with no perceptible (to TVA) social benefits except good will.

¹³OECD, "Economic Implications of Pollution Control", February 1974

¹⁴Author's estimates.

The more difficult to measure, but larger impact of "social costs" in the U.S. may be that of the environmental and health and safety regulations, and their administration, adjudication and disruptive public intervention in the U.S. ability to plan for and provide new indigenous energy supply involving oil, gas, coal, and uranium and electricity from coal and nuclear fuels. These are principal factors now inhibiting energy supply decisions and financial planning, in an otherwise already difficult climate. They tend to increase costs beyond the specific impact of regulation on design and construction requirements and on operations.

THE MAGNITUDE OF CAPITAL REQUIREMENTS

Table X presents an estimate ¹⁵ of World Energy Industry Capital Requirements in billions of *current* dollars for the period 1971-85.

They total \$2 trillion. Of this total, \$780 billion, or about 40%, is for the U.S. alone ¹⁶

The average annual requirements for the 1971-85 period for the World are \$132 billion and for the U.S. alone \$51.9 billion.

This corresponds to 1970 requirements of \$57.8 billion for the World including the U.S. and \$22.5 billion for the U.S. alone.

These figures presume an increase in U.S. energy consumption of 3% per year and for the rest of the world 5.5% per year over the period. For the U.S. the figures represent an increase in energy investment as a percentage of total U.S. gross private investment from 17% in 1970 to more than 22% by 1985. New U.S. energy investment also will constitute a significant and growing portion of total U.S. investment. The estimates for the U.S. are based on the 3% growth in consumption already referred to, and an average (and perhaps too modest) inflation rate for the period 1971-85 of 4%¹⁷. The U.S. capital requirements are thought to change about \$80 billion for each 1% change in energy consumption or for each 1% change in inflation¹⁸.

Finally, the U.S. estimates are subject to upward revision if self-sufficiency is sought. For instance, these estimates do not provide for

¹⁵By the Bechtel Corporation, March 1974.

¹⁶OECD preliminary estimate for the entire OECD area is \$1,100 billion (1972 dollars) for the period 1974-85. No attempt has been made to reconcile the Bechtel and the OECD estimates since the same general conclusions follow from both.

¹⁷This rate is regarded as being very optimistic in light of recent and current inflationary trends. We do not attempt here to substantiate its use by Bechtel.

¹⁸From Bechtel Corp. Report, March 1974.

the accelerated supply and use of electricity concept set forth earlier in this paper. Further, the estimates in Table X do not include allowances for capital requirements for conservation. These have been estimated to be \$330 to \$510 billion (1972 dollars) for the OECD countries in the period 1975-85, depending on the desired conservation results.

During the period 1974-85, it is estimated that the combined GDP of the OECD countries will be in the neighborhood of \$43 to \$45 trillion¹⁹ (1972 dollars). For the OECD countries capital requirements for energy supply are estimated²⁰ to be 3.5 to 4% of the combined GDP during the period. Capital requirements for conservation for the same countries for the same period have been estimated to be 1% of their combined GDP.

(During the same period the cumulative energy *revenue* for the OECD countries is estimated²¹ to be 7.7% of their combined GDP. Imported oil at \$7.20 is estimated²¹ to require the expenditure by the OECD countries of 2.7% of their combined GDP, and at \$10.80, 3.5% of their combined GDP.)²²

THE MAGNITUDE OF FINANCING OF IMPORTS

Table XI presents estimates²³ of the costs per year to the OECD countries of oil imports from OPEC and the cumulation of OPEC current balances through 1980. Oil at \$7.20 a barrel develops a cumulative current balance of \$281 billion in 1980, and at \$10.80 a barrel, a cumulative current balance of \$376 billion in 1980 (1972 dollars).

Other energy imports which will require financing by OECD nations are natural uranium, enriched uranium, coal, technology and capital plant. Much of this trade will be *among* OECD countries, and is not quantified or otherwise dealt with herein.

FINANCING OF CAPITAL REQUIREMENTS AND IMPORTS

We consider the financing problem as involving three categories: (1) financing energy from conventional sources (oil, gas, coal, nu-

¹⁹Based on the Last Long Term Projections published by OECD, extended through 1985.

²⁰Based on GDP data just cited and estimates contained in Energy Prospects to 1985.

²¹Based on The Last Long Term Projections published by OECD, extended through 1985.

²²Author's estimate.

²³Derived from Energy Prospects to 1985, January 1975. (Warning: so many parameters are involved that this is an estimate continuously revised, somewhat downward, it would seem, barring other major changes.)

clear, hydro) with emphasis on indigenous resources where they are available, (2) financing energy from non-conventional sources (coal gasification and liquefaction, shale oil, tar sands, geothermal, solar) and (3) financing the purchase of imported petroleum (and perhaps gas).

FINANCING ENERGY FROM CONVENTIONAL SOURCES

In October of 1973, prior to the oil crisis, Henry H. Fowler presented a statement on "Energy Problems and International Capital Markets" at the Nikko International Conference in Tokyo. The statement did not take into account the subsequent unilateral devastating price increases by OPEC, but it is nonetheless still relevant. Mr. Fowler's summary analysis follows:

"During the period chosen for examination (1971-85), energy consumption demand in the world should increase at a percentage growth rate exceeding those of population and real gross national product and energy capital requirements will grow at a rate more rapid than energy consumption.

"Investment of capital needed to meet this consumption demand will require the flow of an increasing share of the total of investment funds to energy production and distribution.

"This demand for the capital necessary to develop and distribute the energy needed is likely to exceed the supply available from the traditional capital resources—primarily reinvested earnings and securities sold in national capital markets.

"In order to avoid an energy capital shortage and to open channels for the flow of adequate capital to the various sectors of the energy industry, it will be necessary to devise and pursue innovative financing techniques.

"Among other things, these techniques will entail the deepening, enlargement and adaptation of both national and international capital markets for meeting the capital needs for energy operations.

"Marshalling adequate capital supplies for energy will require intensive cooperation between the energy industry and the private financial community. It will also require the cooperation of both with the governments of the producing and consuming countries, and between governments on an international scale."

Today, the U.S. is in a worse state than in October of 1973, considering only financing of current and near term capital requirements for indigenous conventional supply. Energy industry retained earnings are grossly insufficient to provide the necessary capital, and equity and debt offerings of securities are generally unattractive. Continuing anti-profit political agitation, a restrictive approach by the

Congress to environmental and health and safety legislation, generally negative political and public attitudes and resultant uncertainties all make for a most unfavorable investment climate. While it is impossible to estimate with any high degree of accuracy the future demand for all or any forms of energy, or the capital requirements associated therewith, there is a consensus²⁴ that energy requirements for the period through 1985 are substantially larger than current. Correspondingly, the capital requirements are substantially higher. In order for the capital to be available, the earnings and the equity and debt offerings of the energy industry are going to have to be very attractive relative to other sectors of the U.S. economy. Similar conclusions have been set forth often, fully and persuasively by the energy and the banking industries. There is no evidence that they have yet prevailed to the extent required to move the manageability of the current and capital requirements from implausible to feasible.²⁵

Further elaboration on this financing problem and the difficulties inherent in solving it are found in a recent statement²⁶ by Emilio Collado of Exxon quoted briefly as follows:

²⁴Some anti-energy supply growth forces (Ford Foundation Energy Policy Project) appear to accept 2% growth (as opposed to 0%) as being an economic necessity, and some pro-energy supply growth forces (Emilio Collado, Statement of August 19, 1974) appear to accept as low as 3% (instead of 4%) as being probable.

²⁵"In the nine months ending October 1, 1974, the electric utility industry has postponed or cancelled 132,000 megawatts of planned expansion. Approximately two-thirds of this amount (89,000 megawatts) is nuclear based capacity and represents more than half of all capacity additions originally planned as of the beginning of 1974. An even more dramatic aspect of these deferrals is that they amount to more than 2½ times the total nuclear generating capacity currently on line. A nuclear deferral of this magnitude for only one year will force the importation of an additional 850 million barrels of oil—over 2 million barrels per day—at an annual cost of about \$10 billion. These postponements and cancellations have been principally due to the inability of the electric utilities industry to finance the projects. The capital requirements are on the order of \$60 billion. Additionally, 6 major refinery additions have been cancelled within the last few weeks, principally due to increased costs and other investment oriented uncertainties."—Remarks of A. M. Arsht, Special Assistant to the Deputy Secretary of the Treasury, San Diego, CA, December 4, 1974.

²⁶Statement of August 19, 1974, at the Project Independence Hearings, Project Independence: Capital Requirements and International Implications.

"The increased rate of future spending reflects not only the rising unit costs due to technology, remoteness of resources, harsh operating conditions, and the inflationary environment. It also reflects the fact that lead times are long, and heavy front-end cash requirements must be put in place years before the investment begins to produce significant income. The precise amount of capital required will be a function of many factors: inflation, growth in GNP and therefore in energy requirement, elasticity of energy demand, costs of new technologies and resources, and the efficiency of market forces in mobilizing the required capital. Energy conservation, for example, can play a major role in reducing the capital required to produce new supplies. A drop of 0.5% per year in the forecast rate of U.S. energy growth would, over a decade, produce a cumulative decline in the growth in energy needs of 20%. It is not, however, the precise figure for capital requirements that is critical but whether, whatever the amount, it is manageable, and under what conditions it will be forthcoming.

"The magnitude of the capital required is such that we must commit a greater percentage of our GNP to energy if we are to approach our objective. We estimate that energy investment will have to rise from about 2% of GNP in the 1960's to approximately 2.5% in the 1980's. The energy sector's share of total business capital expenditure has averaged about 20% in the 1960's, but is projected to rise to between 30% and 35% in the period to 1985.

"Explicit trade-offs between competing national priorities must be made.²⁷ Unless the proportion of GNP going into saving can be increased, capital availability could be limiting. Since the energy industries, and those which supply equipment and materials to them will require an increased share of the total capital pool, they must compete successfully with other users of capital."

FINANCING ENERGY FROM NON-CONVENTIONAL SOURCES

There are three impediments to investment in non-conventional sources. The first are the normal uncertainties associated with assuring an adequate return on investment in any unproven first (or second, or third) of-a-kind venture. This has to do with being able to recognize and internalize all costs which will be incurred, and all externalities which must be accommodated. The second is the ability to get a stable "competitive" price for the supply commensurate with the return on investment presumed as a basis for proceeding with the

²⁷A reviewer: "Must be made at all times, and for which governments are still poorly equipped."

venture. The third impediment is the fierce overhang represented by the knowledge that there are vast quantities of OPEC oil (and probably other oil and gas) which could, on an arbitrary basis, enter the market at marginal supply prices which could vitiate all assumptions regarding demand for marginal supply from non-conventional resources at the higher prices required for their development.

Ergo, investments in non-conventional supply are likely to be non-conventional investments and/or require non-conventional protection from prospective market forces. Since they are related to providing supply under economic and political circumstances substantially beyond the control of private companies, these investments clearly justify government participation, or protection. Existing private sources can participate in financing to the extent that their risk criteria are met by firm supplier/consumer contracts or by appropriate government loans or guarantees. A government desiring the protection which goes with having non-economic, non-conventional supply available can make the problem simple by entering into long-term purchase contracts with terms which will evoke private financing and supply initiatives, and subsequently sell the supply into the market at the going price for then competitive supply and assume the losses (or profits) associated with such sales. This latter is a recommended course of action.

"Economic" non-conventional supply will and should be funded with the same degree of ease, or difficulty, as conventional supply.

FINANCING ENERGY IMPORTS

The import financing problem is centered on:

- (1) the amount and cost of oil from the OPEC,
- (2) the extent of funds to be transferred to the OPEC in excess of their trade capacity,
- (3) the disposition of the OPEC current balance (surplus), and
- (4) the impact on the trade balances of all of the oil importing countries—developed and less developed.

Table X²⁸ presents an estimate of the magnitude of the problem.

In a recent statement²⁹, Gerald Pollack noted, "Not every problem has a solution, but every situation has an outcome." He goes on to summarize his views (which we adopt in this paper) as follows:

"In coping with the balance-of-payments strains of expensive oil,

²⁸Earlier referred to and summarized. Derived from preliminary OECD data.

²⁹Economy and Politics of Oil: Impact on the World Monetary System. Before the Council on Foreign Relations, November 14, 1974.

the importing countries face a number of alternatives, each of them substitutable to some extent for the others. They can conserve on energy consumption, stimulate indigenous energy production, endeavor to achieve a lower oil price, expand exports to OPEC, finance their payments deficits and adjust to the residual imbalances. In this discussion, we have focused primarily on the last two alternatives.

"We have considered the possible dimensions of the financing problem and speculated on the prospects in the light of OPEC's conservative investment patterns which favor short-term assets in a few countries and institutions. The conservatism is understandable but the heavy burden it places on intermediation for the financing of oil deficits diminishes the probability that recycling will expand to fill the need. A good part of the burden is therefore likely to fall on adjustment via price, income and exchange rate effects. What is not clear is how heavily adjustment will weigh on living standards, output and employment. International cooperation could do a great deal to lighten these burdens. We have also noted that, in the environment created by expensive oil, an outbreak of trade warfare is a danger to reckon with. And this danger is heightened by the non-oil related recessionary pressures which are now gaining force in a number of industrial countries. At present prices, the strains are so immense that no one could safely predict that they will prove to be manageable. The "muddling through" process I have sketched would be one possible outcome. It would be unpleasant and painful. But it would by no means be the worst of the possibilities."

Elsewhere in the same statement, Pollack states: "In all candor, I don't think that anyone's vision can penetrate the uncertainties of the next few years in international finance, let alone the period beyond. There is clearly no unique solution, but rather a broad spectrum of possible outcomes ranging from the relatively painless to the disastrous. Even at the present oil price, the oil-importing nations might be able to manage without undue hardship, if OPEC is prepared to assume a good part of the credit risks of financing their customers (in other words, if broad and uncongested channels for recycling can be maintained), if the oil importers can cooperatively map out adjustment policies appropriate to the situation, and if with all due haste, they take steps to reduce their dependence on oil imports. In the absence of some or all of these conditions, the prevailing oil price might have altogether unmanageable consequences."

IMPACT OF OPEC PRICE INCREASES ON THE U.S.

We also offer ideas developed in considering the impact of OPEC

price increases and "petrodollars"—with specific reference to the U.S. only. They are as follows:

- There is no such currency as a petrodollar, nor will "it" be treated as one in international trade and finance.

- The recent (from \$2 to \$11) increases have the same effect as a massive tax increase levied on the industrial customers of OPEC, and on the LDC's.

- This effect is to instantly reduce purchasing power for demand domestic goods and services by about 20 billion in 1974, for the U.S. alone.

- This is clearly a major deflationary impact on the U.S. economy, far greater, in terms of dollars withdrawn from our economy as new taxes than the U.S. political system would consider, much less allow.

- The dollars transferred from the U.S. economy will return, in greater or lesser amounts, to purchase export goods and services, or as investments.

- The trade goods and services to be purchased are generally not those in short supply in the U.S.

- The investment dollars will presumably seek, or demand, attractive, stable, profitable industrial or utility or government debt or equity.

- Both categories, (trade and investments) will involve some reordering of U.S. priorities, requiring more emphasis on production of goods and services for export, and development of attractive (profitable) debt and equity offerings.

- This could entail less emphasis on domestic social programs and "quality of life" national investments. Greater emphasis on the economic well-being of its productive capability is a prerequisite for the U.S. to assure the maximum recycling of OPEC funds. To the extent that the U.S. does not reorder its priorities to take advantage of this unusual opportunity, it can expect the opposite effect to that suggested.

The above suggest that:

- (1) Although current oil prices are having a serious inflationary effect on costs, purchasing power withdrawn from the U.S. economy by OPEC has an instant deflationary effect on demand.
- (2) OPEC's financial surpluses will necessarily remain in the money and capital markets of the U.S. and other oil importing nations, but it is unlikely that they will initially be distributed according to each country's oil financing requirements: some

will probably receive more than they need, and others less. The challenge for recycling mechanisms is to achieve a redistribution of these funds that the oil importing countries can live with.

- (3) OPEC surpluses are created in the process of transferring income from nations with a high propensity to consume to nations with a high propensity to save. This transfer creates the potential for a shift toward greater investment and higher productivity in the U.S. and other oil importing countries. But whether that potential can be realized will depend largely on whether government and business policies are conducive to real capital formation.

OPEC, OECD AND FINANCING THE LDC's

Corresponding thoughts related to the availability of surplus OPEC funds to the LDC's follow:

- The LDC's are not perceived as being the beneficiaries of any substantial direct largesse by OPEC—in the form of outright grants or loans, though it is hoped that OPEC will perceive the acute need for such loans, or, more realistically, deferments of payment.

- Loans for the LDC's, to the extent they are available, will presumably be provided by the industrialized Free World nations motivated by their normal interest, with OPEC nations funds being involved, directly, to the extent that they are persuaded that their interests are served.

- OPEC funds will be involved indirectly in loans or grants to the LDC's as they contribute to the total capital or credit available to the industrialized nations motivated to support the LDC's.

CONCLUSIONS AND RECOMMENDATIONS FOR THE U.S.

We appear to be in the process of a vast reordering of economic, social and financial priorities and international relationships. Hopefully, energy supplies commensurate with achieving economic growth will be accorded their correct priorities.

Also hopefully, the U.S. and the entire international community will recognize its interdependence and function in sufficient harmony to preclude disasters.

Given a "correct" priority, energy demand and supply assumptions are still uncertain. How energy supply will be financed is even more uncertain. The problems resulting from OPEC actions on supply and price are without precedent, given the presumption that, in today's world, military action is not an acceptable extension of diplomacy in seeking a solution.

Just about all of the major issues have been clear and present since before the 1973 oil supply crisis and subsequent oil price increases. These latter may be helpful in forcing earlier and more realistic resolution of U.S. energy demand and supply and financing issues than otherwise would have occurred.

Recognizing the uncertainties of the future, we do know what has to be done today and tomorrow to provide for the U.S. to meet its future energy demands and to function as a major factor in assisting others.

The goals and recommendations which follow relate principally to financing and providing sufficient energy supply of all forms, including oil, gas, coal, uranium and electricity. Minimizing dependence on external sources and assuring energy supplies sufficient for the economic well-being of the U.S. are both mandatory. Also mandatory is the conservation and efficient use of all energy. This imperative is not elaborated on further, but unless acted upon, it will be impossible in the short term to match supply with demand.

These are recommended goals:

- Availability of energy supply requisite for economic well-being of the U.S.
- Increased domestic energy supply capability and increased use of energy in forms most compatible with this capability.
- Reduced dependence on oil imports.
- Increased ability of U.S. energy industry to plan, finance, and install energy supply to meet U.S. demand.
- Strengthened industrial and governmental institutions charged with responsibility for energy supply and use and more effective results-oriented interaction between industry and government.

These are recommended actions for U.S. domestic supply and use:

- Manage (reduce) demand across the broad spectrum of energy use on a selective basis, but only in support of the goals above.

No single measure will work magically to produce the desired result at all stages of the situation over the next decade. Therefore, resort to a varying mix of measures at various stages of the conservation and use program must be pragmatically sought on non-ideological criteria, including market mechanisms (price), mandatory allocation of imported oil, tax or rationing at the federal level, voluntary conservation programs, etc.

One measure that deserves careful consideration is a new federal tax on gasoline at a rate sufficient to reduce demand, with the proceeds used to:

- compensate for regressive inequities

- defray federal budgetary costs of the energy program
- provide a source of capital for energy supply facilities
- accelerate conservation and more efficient energy use.

The latter would include mass transportation subsidies and more efficient energy use in space heating and industrial use. The tax could be escalated as needed to further curb consumption or to meet financial requirements for energy supply and use systems responsive to national goals.

— Reorder government mandated policy, regulations and incentives to encourage and permit the desired increase in domestic supply capability.

— Accelerate the supply and use of coal and its substitution for oil and gas.

— Accelerate the supply and use of electricity produced from coal and uranium, including its substitution for oil and gas.

— Rationalize the environmental versus energy supply issues and provide an orderly decision-making system for dealing with them. Do the same with all other issues which confuse or impede the availability of sufficient energy supply.

— Carry out major government R&D programs cooperatively with industry in support of increased domestic energy supply and use.

— Assure that regulated and non-regulated energy industries' earnings are sufficient (as perceived by investors) to allow expansion of supply to meet demand. Educate the public further as to the importance of attractive (high) profits as a requisite for assuring adequate financing, and current and future energy supply.

— Encouragement by the U.S. Government of state regulatory bodies to allow earnings of regulated electric and gas utilities to be at levels sufficient to attract the debt and equity capital necessary to supplement retained earnings and depreciation, and thus provide funds needed to meet demand.

— Restructuring of electric utility industry accounting and regulatory practices to assure that all costs, such as construction in progress, more conservative depreciation of existing plant, and fuel and operation and maintenance, are currently reflected in rates.

— Deregulation of new gas and oil and all oil prices together with tax incentives or disincentives to encourage reinvestment of earnings in energy supply capital programs.

— Provide U.S. Government direct or guaranteed loans in support of non-conventional supply and use programs. (These could be made through the recommended Energy Supply Fund on the advice

of the recommended Capital Resources Committee—to be discussed later).

- Enter into long term, competitively developed U.S. Government purchase contracts for “non-conventional” supply at prices which will produce returns on investment resulting in the selected “non-conventional” supply programs being able to compete in the same capital markets as “conventional” supply programs.

- Encourage increased U.S. capital spending on energy supply and use and conservation as an antidote to recession. Use forceful tax incentives.

- Attract and guide surplus OPEC funds to investments in the U.S. energy supply industry—regulated and unregulated, on a non-control portfolio basis. Provide assurance to OPEC investors of a favorable and stable investment climate—and create and maintain one in the U.S. energy industry. (This purpose alone could warrant putting and maintaining the U.S. energy industry in good financial shape.)

- Establish government institutions to assist and expedite government actions on financing and building U.S. energy supply facilities. An Energy Supply Authority, reporting to the President, and an Energy Supply Fund, administered by the Secretary of the Treasury are recommended. It is also recommended that the U.S. Senate and House of Representatives establish a Joint Committee on Energy Supply and Use.

These are recommended actions for imports and recycling of OPEC balance of trade surpluses:

- Reduce U.S. oil import requirements to acceptable dependence and financing levels—by encouraging and forcing conservation.

- Substitute domestically available energy supply for imported oil as soon as possible.

- Not allow changes in exporters’ pricing policy to detract from the drive to relative independence.

- Stockpile as a hedge against supply interruptions.

- Continue import of oil as a part of long-term policy but only up to levels at which interruption of supply can be tolerated.

- Encourage maximum use of the private banking and investment system in recycling of OPEC country balance of trade surpluses.

- Examine how the attractiveness of the U.S. private banking and investment system could be increased in order to maximize its utility in the financial transfers between OPEC and OECD countries. For example, eliminate the withholding tax on foreign non-control portfolio investment in U.S. securities.

— Provide loans through and guarantees for loans by the private banking system where the capacity of the private banking system is inadequate and national purposes are being served.

— Through appropriate bodies such as the IMF, World Bank, OECD and IEA, provide consultation, technology, loans and guarantees in support of assuring adequate energy supply and financing to the OECD countries and the LDC's. (The U.S., as an exporter of coal and enriched uranium, also has a key role as a supplier of energy).

— Integrate OPEC into the OECD countries development of policies governing financing.

— Involve OPEC as fully as they are willing in the solution to the energy-economic problems which they and the OECD countries have together created.

The foregoing pertains principally to the U.S. putting its own house in order. Such a set of actions would provide the U.S. with a much more certain base than now exists for financing and supplying its future energy demands, whatever they may be.

Equally important, the Free World international community will look to the U.S. for leadership only if the U.S. makes sense in the management and financing of its own energy supply and use program. This simply is not the case today.

The recent exemplary initiatives, such as the International Energy Agency, the International Energy Program, and the new international loan and guarantee facilities projected at recent international meetings in Washington, can be but misleading gambits unless backed up by and properly related to effective U.S. management of its own domestic energy supply and use system.

To that end the recommendation is made that the U.S. establish an Energy Supply Authority with the responsibility of expediting the development of the U.S. energy supply system, working through and with, and strengthening, the institutions, private and public, which can make short and near term contributions to increasing energy supply. The Energy Supply Authority would exercise its authority to do what has to be done consistent with general policies and goals established by the President and approved by the Congress. It would have a life of, say five years. The Authority and its staff would consist of strong, experienced managers drawn from industry and government. It would be supply and use oriented. It would be results oriented.

In essence, it would receive the direct delegation of powers from the President that the Congress would delegate to him to deal with

domestic energy supply and use, on the scale and character of the powers delegated to the War Production Board in World War II and the Office of Defense Mobilization in the Korean War.

This recommendation is made with the belief that none of the existing or proposed U.S. government energy organizations is intended to assume clear responsibility for complete and integrated supply actions. Rather, responsibility and authority are fragmented and incomplete. Also, there is today within the U.S. Government (and state governments) much more responsibility and authority which tends to inhibit supply actions, rather than the other way around.

As well, an Energy Supply Fund is recommended. It would be administered by the Secretary of the Treasury, advised by a newly established Capital Resources Committee whose members would be drawn from the financial community, industry and labor. The Capital Resources Committee would advise as appropriate on requirement priorities and means for providing capital resources. A fund derived from special taxes on energy use, such as recommended above, could be the vehicle for providing loans and guarantees directly, and stimulating the private money markets to provide the larger capital requirements needed to move the energy supply program forward. If the capital requirements for conventional energy supply could be met without depending on the Fund, it could then be directed to development of "non-conventional" energy supply and use.

Organization by the House and Senate of a Joint Committee on Energy Supply and Use is recommended. Such a Committee could provide for badly needed focus and coherent Congressional decision-making on energy supply and use matters which require Congressional action.

This Committee would be comparable in its function and position to the Joint Committee on Defense Production created by the Defense Production Act of 1950 to oversee production and supply during the Korean War, and to the Joint Committee on Atomic Energy.

The newly activated Energy Research and Development Administration (ERDA) will slowly assume a not yet defined working role in the U.S. energy supply and use system. Beyond the continuing and quite variable activities of its precursors—US AEC, OCR, etc.—it is not yet functioning in international missions. If ERDA succeeds in relating itself correctly and constructively to the dominantly private U.S. energy supply and use system, and to the many relevant public and private international institutions, ERDA then can play a very effective role in representing the U.S. in some of the U.S.'s international contributions, and in institutions such as the IEA.

About the Author

John E. Gray, a member of the Atlantic Council's Energy Committee and a director of a number of energy-related corporations, formerly served as President, Chairman of the Board and Chief Executive Officer of the NUS Corporation, and has since 1972 been an energy consultant to the Ford Foundation Energy Policy Project, the Edison Electric Institute, the Federal Energy Administration, the MIT Center for Policy Alternatives and the (Uranium) Enrichment and Reprocessing Group of the Japanese Electric Utility Industry.

Gray is the author of *Energy Policy: Industry Perspectives*, and co-author of *Energy Research and Development* (by J. Herbert Holomon, et al), both being published by the Ballinger Publishing Co., Cambridge, early in 1975.

TABLE I
OECD Countries Energy Production, Imports and Consumption
Actual for 1972, Estimated for 1980*

Mtoe (10 ¹³ Kcal)**	Actual 1972 Data(4)	Base*** Projection	\$7.20 Case	% Change	\$10.80 Case	% Change
COAL						
Indigenous	670.3	771.6	875.2	+13.4	880.2	+14.1
Imports	21.9	9.2	23.3	+153.3	9.7	+5.4
Consumption	669.8	780.8	898.5	+15.1	889.9	+14.0
OIL						
Indigenous	692.6	896.0	998.4	+11.4	1089.4	+21.6
Imports	1224.3	2014.3	1446.4	-28.2	1084.4	-46.2
Consumption	1917.3	2910.3	2444.8	-16.0	2173.8	-25.3
NATURAL GAS						
Indigenous	747.0	766.1	866.9	+13.2	983.0	+28.3
Imports	7.1	186.5	126.6	-32.1	103.2	-44.7
Consumption	744.5	952.6	993.5	+4.3	1086.3	+14.0
NUCLEAR(1)	34.8	305.9	325.6	+6.4	325.6	+6.4
HYDRO & GEOTHERMAL(2)	96.6	117.9	123.5	+4.8	124.5	+5.6
GROSS ELECTRICITY PRODUCTION(3)	345.3	572.5	571.0	-0.3	569.1	-0.6
TOTAL PRIMARY ENERGY (TPE)	3463.3	5067.6	4786.0	-5.6	4600.0	-9.2
INDIGENOUS SUPPLY (% of TPE)	2241.8 (64.7)	2857.5 (56.4)	3189.6 (66.6)	+11.6	3402.8 (74.0)	+19.1
IMPORTS (% of TPE)	1253.3 (36.2)	2210.1 (43.6)	1596.4 (33.4)	-27.8	1197.4 (26.0)	-45.8

(1) Primary Energy Equivalent (1 TWh = 0.2436 Mtoe)

(2) Primary Energy Equivalent (1 TWh = 0.1064 Mtoe)

(3) Calorific Content of Electricity Produced (1 TWh = 0.086 Mtoe)

(4) Stock Changes excluded: they represent the difference between indigenous plus imports and consumption.

* From OECD Report, January 1975

** See Table XII for conversion to other units.

*** By OECD, prior to October 1973 oil and other energy relative prices.

TABLE II
OECD Countries Energy Production, Imports and Consumption
Actual for 1972, Estimated for 1985*

Mtoe (10 ¹³ Kcal)**	Actual 1972 Data (4)	Base*** Projection	\$7.20 Case	% Change	\$10.80 Case	% Change
COAL						
Indigenous	670.3	943.9	1045.9	+10.8	1050.9	+11.3
Imports	21.9	7.1	2.3	-67.6	-14.8	
Consumption	669.8	951.0	1048.2	+10.0	1036.1	+8.9
OIL						
Indigenous	692.6	937.1	1149.0	+22.6	1380.0	+47.3
Imports	1224.3	2634.0	1661.9	-36.9	1071.6	-59.3
Consumption	1917.3	3571.1	2810.9	-21.3	2451.6	-31.3
NATURAL GAS						
Indigenous	747.0	827.7	1019.2	+23.1	1100.4	+32.9
Imports	7.1	280.1	177.8	-36.6	144.4	-48.4
Consumption	744.5	1107.8	1197.0	+8.1	1244.8	+12.4
NUCLEAR (1)	34.8	657.2	756.1	+15.0	756.1	+15.0
HYDRO & GEOTHERMAL (2)	96.9	133.4	154.1	+16.0	161.5	+21.1
GROSS ELECTRICITY PRODUCTION (3)	345.3	787.7	791.1	+0.4	790.9	+0.4
TOTAL PRIMARY ENERGY (TPE)	3463.3	6420.5	5966.6	-7.1	5650.5	-12.0
INDIGENOUS SUPPLY (% of TPE)	2241.8 (64.7)	3499.3	4124.8 (69.1)	+25.0	4448.9 (78.7)	+34.8
IMPORTS (% of TPE)	1253.3 (36.2)	2921.2	1841.8 (30.9)	-41.0	1201.1 (21.3)	-61.5

(1) Primary Energy Equivalent (1 TWh = 0.2436 Mtoe)

(2) Primary Energy Equivalent (1 TWh = 0.1064 Mtoe)

(3) Calorific Content of Electricity produced (1 TWh = 0.086 Mtoe)

(4) Stock Changes excluded: they represent the difference between indigenous plus imports and consumption.

* From OECD Report, January 1975

** See Table XII for conversion to other units.

*** By OECD, prior to October 1973 oil and other energy relative prices.

TABLE III
U.S.A. Energy Production, Imports and Consumption
Actual for 1972*

Mtoe (10 ¹³ Kcal)**	Coal	Oil	Gas	Electricity	Nuclear	Hydro & Geothermal	Total
Indigenous Supply	365.4	560.3	571.6		14.1	29.7	1541.1
Imported Supply (net)	-38.8	254.6	24.8		—	—	240.6
Stock Changes(1)	-13.4	9.9	-9.0				-12.5
TOTAL PRIMARY ENERGY	313.2	824.8	587.4		14.1	29.7	1769.2
Electricity Generation	191.0	80.8	104.8	-169.8	14.1	29.7	250.6
TOTAL FINAL CONSUMPTION	122.2	744.0	482.6	169.8			1518.6
Energy Sector & Losses	15.0	35.7	28.1	22.2			101.0
Industry	97.3	50.8	262.2	64.5			474.8
Transportation	0.2	430.9(2)	—	0.4			431.5
Residential/ Commercial	9.7	140.9	192.3	82.7			425.6
Non-Energy Oil		85.7					85.7

(1) Withdrawals (+), Additions (-)

(2) Includes 308.6 gasoline; 7.7 ships' bunkers

* From OECD Report, January 1975.

** See Table XII for conversion to other units.

TABLE IV
U.S.A. Energy Production, Imports and Consumption
Actual for 1972, Estimated for 1980*

Mtoe (10 ¹³ kcal)**		Coal	Oil	Gas	Electricity	Nuclear	Hydro & Geothermal	Total
Indigenous	a)	470.0	580.9	496.4		139.7	35.1	1722.1
Supply(1)	b)	537.0	650.0	541.0		139.7	36.8	1904.5
	c)	537.0	719.0	613.0		139.7	36.8	2045.5
Net Imported		-44.6	541.9	138.3				635.6
Supply		-46.8	331.2	58.4				342.9
		-64.9	140.8	42.2				118.1
TOTAL PRIMARY		425.4	1122.8	634.7		139.7	35.1	2357.8
ENERGY		490.2	981.2	599.4		139.7	36.8	2247.4
		472.1	859.8	655.2		139.7	36.8	2163.6
Electricity		295.2	151.8	90.0	-267.7	139.7	35.1	444.2
Generation		349.9	100.0	70.0	-263.0	139.7	36.8	433.4
		331.8	90.0	90.0	-260.1	139.7	36.8	428.1
Synthetic Fuel		12.1	11.1	-17.8				5.4
Production		25.1		-17.8				7.3
		25.1		-17.8				7.3
TOTAL FINAL		118.1	959.9	562.5	267.7			1908.2
CONSUMPTION		115.3	881.2	547.2	263.0			1806.7
		115.3	769.8	583.0	260.1			1728.2
Energy Sector		18.8	43.4	39.5	37.1			138.8
and Losses		21.5	38.6	37.4	36.5			133.9
		21.5	35.7	40.7	36.1			134.0
Industry		92.3	101.8	280.6	90.9			565.6
		86.8	96.0	276.7	88.2			547.7
		86.8	55.0	283.0	86.6			511.3
Transportation			540.3		0.8			541.1
			510.4		0.8			511.2
			487.3		0.8			488.1
Residential/		7.0	162.0	242.4	138.9			550.3
Commercial		7.0	157.0	233.1	137.6			534.7
		7.0	116.0	259.3	136.7			519.0
Non-Energy Oil			112.4					112.4
			79.3					79.3
			75.8					75.8

(1) Potential coal production in the \$10.80 case is as large as 650 Mtoe, but the figure used here is lower because of difficulties in finding markets. Oil from shale accounts for 2.5, 15.4, and 25.5 Mtoe, and geothermal electricity for 1.5, 3.2 and 3.2 Mtoe in the base, \$7.20 and \$10.80 cases, respectively.

a) Base projection***; b) \$7.20 projection; c) \$10.80 projection.

* From OECD Report, January 1975

** See Table XII for conversion to other units.

*** By OECD, prior to October 1973 oil and other energy relative prices.

TABLE V
U.S.A. Energy Production, Imports and Consumption
Actual for 1972, Estimated for 1985*

Mtoe (10 ¹³ kcal)**		Coal	Oil	Gas	Electricity	Nuclear	Hydro & Geothermal	Total
Indigenous	a)	622.4	575.4	462.6		294.7	39.4	1994.5
Supply (1)(2)	b)	660.0	750.0	583.0		356.1	52.3	2401.4
	c)	660.0	938.0	623.0		356.1	53.2	2630.3
Net Imported		-55.5	731.0	211.0				886.5
Supply		-76.1	254.6	87.1				265.6
		-91.3	-67.5	51.0				-107.9
TOTAL PRIMARY		566.9	1306.4	673.6		294.7	39.4	2881.0
ENERGY		583.8	1004.6	670.2		356.1	52.3	2667.0
		568.6	870.5	674.0		356.1	53.2	2522.4
Electricity		389.1	167.5	85.5	-369.5	294.7	39.4	606.5
Generation		401.3	50.0	60.0	-363.1	356.1	52.3	556.6
		386.1	50.0	60.0	-360.5	356.1	53.2	544.9
Synthetic Fuel		54.6	16.9	-51.0				20.5
Production		74.4		-51.0				23.4
		74.4		-51.0				23.4
TOTAL FINAL		123.2	1122.0	639.3	369.5			2234.0
CONSUMPTION		108.2	954.6	661.2	363.1			2087.0
		108.2	820.5	665.0	360.5			1954.1
Energy Sector		24.9	43.4	45.3	51.1			164.7
and Losses		26.4	38.3	45.1	50.2			164.7
		26.4	34.0	45.7	49.9			155.9
Industry		95.8	126.5	321.4	138.3			682.0
		79.3	100.0	322.9	134.6			636.7
		75.3	65.0	305.9	133.1			583.2
Transportation			641.4		0.9			642.3
			584.6		0.9			585.5
			538.5		0.9			539.4
Residential/		2.5	188.4	272.6	179.2			642.7
Commercial		2.5	145.0	293.2	177.4			618.1
		2.5	100.0	313.5	176.7			592.6
Non-Energy Oil			122.3					122.3
			86.8					86.8
			83.0					83.0

(1) Potential coal production in the \$10.80 case is as large as 960 Mtoe, but the figure used here is lower because of difficulties in finding markets. Oil from shale accounts for 12.6, 50.7 and 76.1 Mtoe, and geothermal electricity for 3.0, 14.3 and 14.3 Mtoe in the base, \$7.20 and \$10.80 cases respectively.

(2) Solar energy is omitted, although the quantities involved, while negligible in 1980 and in the basic and \$7.20 bases in 1985, could be as much as 100 Mtoe in the \$10.80 case for 1985. It could be consumed in the residential/commercial sector.

a) Base projection***; b) \$7.20 projection; c) \$10.80 projection

* From OECD Report, January 1975

** See Table XII for conversion to other units.

*** By OECD, prior to October 1973 oil and other energy relative prices.

TABLE VI
Total Primary Energy Requirements and Average Annual Energy Consumption
Estimated Growth Rates for the Base Projection*, \$7.20 and \$10.80 Cases for the Period 1972-85**

TPER(2) 1972	U.S.A.	Canada	E.E.C.	OECD Europe	Japan	Australia (1)	New Zealand (1)	Total OECD
1980:	1769.2	155.1	958.7	1157.5	318.5	55.8	7.4	3463.3
Base Projection TPER	2357.8	234.8	1412.8	1729.5	636.4	97.7	11.4	5067.6
Average Growth Rate 1972-80(%)	3.7	5.3	5.0	5.1	9.0	7.3	5.5	4.9
\$7.20 case TPER	2247.4	220.4	1336.8	1632.4	576.7			4786.0
% Decrease from Base Projection	-4.7	-6.1	-5.4	-5.6	-9.4			-5.6
Average Growth Rate 1972-80(%)	3.0	4.5	4.2	4.4	7.7			4.1
\$10.80 Case TPER	2163.6	211.5	1278.4	1561.5	554.5			4600.2
% Decrease from Base Projection	-8.2	-9.9	-9.5	-9.7	-12.9			-9.2
Average Growth Rate 1972-80(%)	2.5	4.0	3.7	3.8	7.2			3.6
1985:	2881.0	292.9	1785.2	2244.9	854.1	133.4	14.2	6420.5
Base Projection TPER	3.8	5.0	4.9	5.2	7.9	6.9	5.1	4.9
Average Growth Rate 1972-85(%)								
\$7.20 Case TPER	2667.0	272.4	1686.4	2121.1	758.5			5966.6
% Decrease from Base Projection	-7.4	-7.0	-5.5	-5.5	-11.2			-7.1
Average Growth Rate 1972-85(%)	3.2	4.4	4.4	4.8	6.9			4.3
\$10.80 Case TPER	2522.4	248.8	1607.3	2022.7	708.5			5650.0
% Decrease from Base Projection	-12.4	-15.1	-10.0	-9.9	-17.0			-12.0
Average Growth Rate 1972-85(%)	2.8	3.7	4.1	4.4	6.3			3.8

(1) No alternative cases.

(2) Total Primary Energy Requirements in Mtoe (10^{13} Kcal). See Table XII for conversion to other units.

* By OECD, prior to October 1973 oil and other energy relative prices.

** From OECD Report, January 1975.

TABLE VII
Electricity Use and Fuel Requirements in U.S.—
Normal Versus Accelerated Use of Electricity*

● Anticipated "Normal" Growth—Use of electricity:**

(All energy grows 3.6% 1972-85 and 2.1% 1986-2000; electricity grows 5.6% 1972-85 and 4.7% 1986-2000).

	1972	1985	2000
Category	Quadrillion BTU		
Transportation	0.018	0.04	0.05
Residential	1.89	4.85	6.2
Commercial	1.55	2.97	6.0
Industrial	2.46	4.41	11.8
TOTAL	5.9	12.3	24.0

● Potential Accelerated Use of Electricity

	1972	1985	2000
Category	Quadrillion BTU		
Transportation	0.018	0.54	3.0
Residential	1.89	4.5	8.0
Commercial	1.55	4.0	8.0
Industrial	2.46	6.0	19.0
TOTAL	5.9	15.0	38.0

● U.S. Fuel Requirements—"Normal" Versus Accelerated Use of Electricity

	1972		1985		2000
			Quadrillion BTU		
Fuel	Normal	Normal	Accelerated Electricity	Normal	Accelerated Electricity
Natural Gas	23.3	25.0	18.0	21.0	9.3
Oil	32.6	45.0	31.0	45.0	17.0
Coal	12.3	28.0	36.0	46.0	57.0
Other***	3.5	15.0	25.0	46.0	95.0
TOTAL	71.7	113.	110.	158.	178.

* Data for 1972 and estimates re energy demand, and substitutability were derived from reports of Power Systems Planning Department of Westinghouse Electric Company dating back to 1972 and updated to January 19, 1975.

** Based on electrical equivalent of 1 kwhr = 3413 BTU

*** Nuclear, Hydro, Synthetic from coal.

TABLE VIII
Substitutability of Electricity for Oil and Gas in End Use*

	Use in 1972	Reduction in Use** 1985	2000	Use in 1972	Reduction in Use** 1985	2000
<i>Transportation</i>						
Auto				10.1	1.4	8.6
Air Rail				1.4		2.9
Rail				.4	(.40)***	1.9
Truck				4.0	.9	2.3
Other***	.80	.80	2.2	1.3	(2.21)***	3.3
Sub-Total	.80	.80	2.2	17.2	.6	19.0
<i>Residential</i>						
Space Heating	3.41	.3	1.4	3.15	.8	
Water Heating	1.12	.13	.4	.13	(.02)***	
Air Conditioning	.004					
Refrigeration	.005					
Lighting						
Cooking	.34	.04	.1	.013		
Other****	.39	.98	1.5		(.17)***	
Sub-Total	5.27	1.40	3.4	3.29	.60	
<i>Commercial</i>						
Space Heating	1.32	.40	.1	2.63	2.0	
Water Heating	.44		.1			
Air Conditioning	.13					
Refrigeration						
Lighting						
Cooking	.14	.05	.05			
Other****	.34	.47	(1.35)***	77	3.18	2.3
Sub-Total	2.37	.9	(1.1)***	3.40	5.20	2.3
<i>Industrial</i>						
Process Steam	5.8	4.12	3.3	2.35	2.47	3.1
Direct Heat	2.77	.64	2.4	3.02	.78	1.6
Electric Drive						
Electrolytic						
Other****	2.15	2.19	1.5	.17	3.95	2.0
Sub-Total	10.72	6.95	7.2	5.54	6.5	6.7
TOTALS	19.2	7.0	11.7	29.4	14.0	28.0

* Data for 1972 and estimates re energy demand, and substitutability were derived from reports of Power Systems Planning Department of Westinghouse Electric Company dating back to 1972 and updated through January 19, 1975.

** Amount not required because of substitution of electricity for same end use (or consumer purpose) under accelerated program.

*** Increase

**** See *SRI Patterns of Energy Consumption in U.S.*, Prepared for OST, for Definitions.

TABLE IX
Capital Requirements—For All U.S. Energy Programs—
Normal versus Accelerated Use of Electricity
(Cumulative—Billions of 1974 \$) *

	1974—1985		1986—2000	
	Normal Electric	Accelerated Electric	Normal Electric	Accelerated Electric
Oil and gas	106	65	136	54
Syn-Liquids and gas	10	22**	94	93**
Coal	23	26	36	29
Nuclear Fuel	7***	11***	20***	51
Sub total Fuel	146	124	286	227
Electric Utility	260	287	346	766
Electric Manufacture	46	50	58	129
Sub-total Electric	306	337	404	895
TOTAL	452	461****	690	1122****

* Data derived from reports of Power Systems Planning Department of Westinghouse Electric Company dating back to 1972 and updated through January 19, 1975. The earlier Westinghouse figures on capital requirements have been arbitrarily revised by the author to reflect very recent (downward) changes in estimates of future energy demand. These figures are presented only as being indicative of the impact on capital requirements of the accelerated electricity program. They are not necessarily consistent with the OECD or Bechtel Corp. data presented elsewhere in this paper. The author considers the individual absolute values questionable.

** To make up for diminishing domestic supply of natural gas and crude oil for nonsubstitutable uses.

*** Do not include investment in electric power plants—to supply power to uranium enrichment plants, estimated to be \$3 to 4 billion in 1974-85 and \$2 to 3 billion in 1986-2000.

**** The increase in capital requirements is offset during the same period by fuel cost savings (oil and gas not needed) and by capital not required for oil and gas supply.

TABLE X
Energy Industry Capital Requirements*
(In Billions of Current Dollars)

Period	Petroleum	Gas	Coal	Nuclear	Electric Generation	Total
1970						
U.S.	6.3	5.3	0.4	0.3	10.2	22.5
Rest of World	12.3	2.0	1.0	—	20.0	35.3
TOTAL	18.6	7.3	1.4	0.3	30.2	57.8
Average Annual 1971-1985						
U.S.	16.5	7.3	1.1	1.7	25.3	51.9
Rest of World	20.0	8.0	5.0	1.3	46.7	81.0
TOTAL	36.5	15.3	6.1	3.0	72.0	132.9
Total 1971-1985						
U.S.	248.0	110.0	17.0	25.0	380.0	780.0
Rest of World	300.0	125.0	75.0	20.0	700.0	1220.0
TOTAL	548.0	235.0	92.0	45.0	1080.0	2000.0

* Data for 1972 and estimates for 1971-85 from *Capital Requirements of the Energy Industry*, Bechtel Corporation (Slavich and Snyder), March, 1974.

TABLE XI
Estimated Evolution of OPEC Current Balances, \$7.20 and \$10.80 Cases, 1973-1980*
Billion Current U.S. Dollars (except where otherwise specified)

	1973	1974	1975	1976	1977	1978	1979	1980
<i>\$7.20</i>								
Oil Exports f.o.b.	31	100	84	100	114	126	133	140
Other Exports (1)	5	7	9	11	13	16	20	24
Imports (1)	25	34	47	57	70	85	103	125
Surplus	11	73	46	54	57	57	50	39
Investment Income (2)	1	6	15	23	21	27	33	40
Current Balance	12	79	61	77	78	86	83	79
Cumulative Current Balance	12	91	152	229	307	391	474	553
Current Balance (\$ 1972)	11	66	45	52	49	49	45	40
Cumulative Current Balance (\$ 1972)	11	76	113	152	191	227	257	281
<i>\$10.80</i>								
Oil Exports f.o.b.	31	100	120	137	149	158	160	162
Other Exports (1)	5	7	9	11	13	16	20	24
Imports (1)	25	34	51	62	76	93	114	140
Surplus	11	73	78	86	86	81	66	45
Investment Income (2)	1	6	17	29	27	36	45	53
Current Balance	12	79	94	115	114	117	111	99
Cumulative Current Balance	12	91	185	300	414	531	642	741
Current Balance (\$ 1972)	11	66	70	77	71	68	60	50
Cumulative Current Balance (\$ 1972)	11	76	138	200	257	309	349	376

(1) Includes services and private transfers other than income from external investments.

(2) Earning from external investment only.

* OECD data, January 1975

TABLE XII
Definition and Conversion Table

	Mtoe = million tons of oil equivalent
1 Mtoe	= 10^{13} kilocalories
1 Mtoe	= 3.968×10^{13} BTU
1 Mtoe	= 1.56×10^6 tons coal*
1 Mtoe	= 6.83×10^2 barrels of oil**
50 Mtoe	= 1,000,000 barrels/day
1 Mtoe	= 40 billion cubic feet of Natural Gas***
25 Mtoe	= 1 trillion cubic feet of Natural Gas
1 Mtoe	= 1.16×10^{12} Kilowatthours electricity****

* 24×10^6 BTU/Short Ton Coal

** 5.62×10^6 BTU/Barrel Oil

*** 1,031 BTU/Cubic Foot Gas

**** 3,142 BTU/Kilowatthour (in final consumption)

Members of the Atlantic Council Energy Steering Committee

Chairman:

Hon. Henry H. Fowler—Partner, Goldman, Sachs & Co.; Former Secretary of the Treasury; Chairman, Atlantic Council

Rapporteur:

Hon. Harlan Cleveland—Director, Aspen Program in International Affairs; Former Assistant Secretary of State, Former Ambassador to NATO; Director, Atlantic Council

Members:

Hon. Theodore C. Achilles—Former Counselor of the State Department and Ambassador; Vice Chairman, Atlantic Council

Mr. Charles F. Adams—Chairman, Raytheon Company

Hon. W. Randolph Burgess—Former Under Secretary of the Treasury; Ambassador to NATO and OEEC; Vice Chairman, Atlantic Council

Mr. John Campbell—The Trilateral Commission

Mr. Emilio Collado—Executive Vice President, Exxon Corporation; Director, Atlantic Council

Dr. Sherwood L. Fawcett—President, Battelle Memorial Institute; Director, Atlantic Council

Mr. John P. Fishwick—President, Norfolk and Western Railway Company

Mr. John E. Gray—Energy Consultant

Mr. Joseph W. Harned—Deputy Director General, Atlantic Council; U.S. Representative, Atlantic Institute

Hon. Parker T. Hart—Special Representative for the Middle East and North Africa, The Bechtel Corporation; Former Ambassador and Assistant Secretary of State for Near Eastern and South Asian Affairs

Mr. Peter Hofmann—Battelle Memorial Institute

Dr. John E. Kircher—President, Continental Oil Co.

Mr. Tom Killefer—Vice President, Chrysler Corporation; Secretary, Atlantic Council

Mr. Walter J. Levy—Energy Consultant

Hon. William McChesney Martin—Former Chairman, Board of Governors of the Federal Reserve; Director, Atlantic Council

Mr. Cecil J. Olmstead—Vice President, Texaco, Inc.

Mr. Taylor Ostrander—Assistant to the Chairman, American Metal Climax, Inc.

Hon. David Packard—Chairman of the Board, Hewlett-Packard Company; Former Deputy Secretary of Defense; Director, Atlantic Council

Mr. Hoyt Price—Director, Information Research Division, Gulf Oil Company

Dr. Simon Ramo—Vice Chairman of the Board, TRW, Inc.

Dr. Sidney E. Rolfe—International Economist; Director, Atlantic Council

Hon. Robert V. Roosa—Brown Brothers, Harriman and Co.; Former Under Secretary of the Treasury for Monetary Affairs; Director, Atlantic Council

Mr. Philip N. Ross—Manager, Power Systems Planning, Westinghouse Electric Corporation

Mr. Nathaniel Samuels—Chairman of the Board, Louis Dreyfus Corporation; Former Under Secretary of State for Economic Affairs; Director, Atlantic Council

Mr. E. Keith Thomson—Vice President, Bechtel International Services Corporation

The Atlantic Council of the United States

BOARD OF DIRECTORS

Chairman	Treasurer
Henry H. Fowler	Percival F. Brinldage
Vice Chairmen	Secretary
W. Randolph Burgess	Tom Killefer
Livingston T. Merchant	Acting Director General
Lauris Norstad	Joseph W. Harned
Theodore C. Achilles	Assistant Director General
Eugene V. Rostow	Martha C. Finley
Alexander B. Trowbridge	

Directors

Donald G. Agger	J. George Harrar	Lithgow Osborne
Frank Altschul	Livingston Hartley	Robert E. Osgood
George W. Ball	Christian A. Herter, Jr.	Henry D. Owen
Janann G. Baker	John D. Hickerson	David Packard
Edward W. Barrett	Claire Giannini Hoffman	Peter G. Peterson
Francis M. Bator	J. Allan Hovey, Jr.	H. H. Porter
Justin Blackwelder	Thomas L. Hughes	Ogden R. Reid
W. Michael Blumenthal	Henry M. Jackson	Jacques J. Reinstein
Landrum R. Bolling	Jacob K. Javits	Emmett J. Rice
Gene E. Bradley	Owen B. Kiernan	Olin Robison
William A. M. Burden	Henry A. Kissinger	William P. Rogers
Hodding Carter, III	John M. Leddy	Sidney E. Rolfe
Harlan Cleveland	Lyman L. Lemnitzer	Robert V. Roosa
Emilio G. Collado	Walter J. Levy	H. Chapman Rose
Richard N. Cooper	Mary P. Lord	Dean Rusk
Frederick L. Deming	Jay Lovestone	Nathaniel Samuels
Robert L. Dennison	David W. MacEachron	J. Robert Schaezel
Douglas Dillon	John J. McCloy	Adolph W. Schmidt
Walter Dowling	J. S. McDonnell	Cortlandt V. R. Schuyler
William D. Eberle	Lawrence C. McQuade	Gerard C. Smith
Robert Ellsworth	Harald B. Malmgren	Frank A. Southard, Jr.
Brooks Emeny	Edwin M. Martin	Kenneth M. Spang
Sherwood L. Fawcett	Wm. McChesney Martin	Timothy W. Stanley
William C. Foster	George Meany	Ralph I. Straus
George S. Franklin, Jr.	Samuel W. Meek	Ellsworth Tompkins
Richard N. Gardner	Walden Moore	Philip H. Trezise
Carl J. Gilbert	Howard Morgens	John W. Tuthill
Andrew J. Goodpaster	Malcolm Muir	Marina v. N. Whitman
Alfred M. Gruenther	Robert D. Murphy	Francis O. Wilcox
	Frederick E. Nolting, Jr.	Patricia M. Williams

Mobilizing the Utilities For War

By
EDWARD FALCK



REPRINTED FROM THE JULY 6, 1944, ISSUE OF
PUBLIC UTILITIES FORTNIGHTLY
WASHINGTON, D. C.

Public Utilities

FORTNIGHTLY



Mobilizing the Utilities for War

Through improved design and engineering practice, through wide interconnection and coördination of facilities, through unique resourcefulness in overcoming the countless handicaps which war conditions impose, the utility systems, says the author, have made good their pledge that service would never be too little or too late.

By EDWARD FALCK

DIRECTOR, OFFICE OF WAR UTILITIES

THE war on the home front is epitomized by the battle for production. That battle is being won and the victory will prove decisive in the great military struggle which still lies ahead.

The War Production Board was created for the purpose of serving as a sort of general staff to direct the battle for production. The Office of War Utilities functions within the War Production Board through five operating divisions responsible for power, manufactured gas, natural gas, water, and communications. In addition to these

operating divisions, there are four staff branches which are responsible for materials control, fuel and allocations, inventory control, and administration. Within an operating division, basic responsibilities are generally divided among three major fields:

- (1) Supply; (2) materials distribution; and (3) allocation.

The Office of War Utilities is the agency created within the War Production Board for the purpose of exercising the wartime powers and responsibilities of the War Production Board

PUBLIC UTILITIES FORTNIGHTLY

in the field of public utilities—electric power, natural and manufactured gas, water, wire communications, and central steam heating—as well as in the field of utility equipment manufacture. The maintenance of these utility services is essential to the country in times of peace, and vital in times of war. The entire mobilization of industry, transportation, and man power during the war has been predicated upon the uninterrupted flow of utility services.

BEGUN in 1941 as two separate branches (the "Power Branch" and "Communications Equipment"), the Office of War Utilities is today a smoothly operating organization. It has a charter from the chairman of the War Production Board authorizing it to exercise directly virtually all of WPB's power in the public utility and equipment manufacturing areas for which it is responsible. It has a staff of approximately 400 employees; an annual budget of about \$1,130,000; some fourteen industry advisory committees on which more than 150 utility and business leaders serve without compensation; harmonious and effective working arrangements as to jurisdiction with other government agencies having regulatory and other responsibilities with respect to utility operations; and an administrative-legislative framework of orders governing the flow of materials for maintenance, repair, and operating supplies and for construction, the scheduling of equipment production, inventory control, equipment specifications, conservation and standardization, operations during periods of shortage, and restrictions on new utility connections.

This was not always so. At the outset

there was no staff, there were no orders, there was no established working relationship with the industry or with other governmental agencies. The job to be done was totally undefined. Looking backwards, it is possible to identify the basic principles which have contributed to building up the organization and getting the job done.

PERHAPS the most important contributing factor in the development of the Office of War Utilities has been the high quality of the staff that was assembled to do the job. The men who came to Washington to join the ranks of the predecessor Power Branch and the Communications Equipment Branch were far beyond the average in ability and courage. During the early days in 1941, they endured the most disruptive working conditions. Washington agencies were mushrooming all over the city. Temporary buildings were under construction. Floor space was at a premium.

At one time the Power Branch had only 35 square feet per employee. Men had their desks in aisles. Some even worked in their hotel rooms for want of office space. Telephones were difficult to obtain and numbers were changed almost weekly. The offices and aisles were crowded with utility engineers trying to file priority applications in person, applicants for jobs, purchasing agents, Congressmen, manufacturers' representatives, chambers of commerce representatives, and inventors. The noise was terrific. Men began work at 8 or 9 A.M. and rarely left their desks at noon; they did not quit until 9 P. M., and, not infrequently, they worked on until midnight.

MOBILIZING THE UTILITIES FOR WAR

IT was under these circumstances of stress that the basic thinking for the whole utilities program was done. In these noisy and crowded offices were developed the original Order P-46 (now U-1) controlling materials for maintenance, repair, and construction by electric, gas, and water utilities; the original Orders L-50, P-130, and P-132, controlling wire communications utilities; the first power Limitation Order (L-16) providing for the pooling of power resources in the Southeast and the curtailment of power during the drought-created shortage; the power expansion program involving the installation of about 7,000,000 kilowatts of capacity during 1942-1944.

The staff was recruited in a manner designed to secure the best possible balance of different viewpoints and experience. Electrical engineers and operating men, whether drawn from public agencies such as the Tennessee Valley Authority, the Bonneville Power Administration, or the Los Angeles Bureau of Power & Light, or from the private electric utilities or from manufacturing companies, once they became members of the staff, whether on salaried or dollar-a-year basis, ceased to represent the agency or company or area from which they had been drawn.

The success of the Office of War Utilities in working out harmonious relationships with other governmental agencies having responsibilities with respect to utility operations has also been something of an achievement, considering such diverse bodies operating in the same general field as the FPC, FCC, SEC, BWC, TVA, REA, Army Engineers, Reclamation Bureau, and regulatory commissions in some forty states.

CAREFUL study disclosed, however, that none of the existing government agencies would be in a position to discharge the special responsibilities of the War Production Board arising out of national defense and the possibility of war. This conclusion rested upon three principal considerations. First, the jurisdiction of a war agency must be total; that is, it must cover all 48 states and all types of systems, publicly and privately owned or coöperative. No state or Federal agency had such complete jurisdiction. Second, planning the installation of power capacity, the construction of new natural gas pipe lines, or the addition of telephone central offices, like any other major new construction during the war, must be done in relation to programs for military production which



Q "THE War Production Board was created for the purpose of serving as a sort of general staff to direct the battle for production. The Office of War Utilities functions within the War Production Board through five operating divisions responsible for power, manufactured gas, natural gas, water, and communications. In addition to these operating divisions, there are four staff branches which are responsible for materials control, fuel and allocations, inventory control, and administration."

PUBLIC UTILITIES FORTNIGHTLY

are coördinated by the War Production Board. Third, the war planning agency must have a single purpose and should not be distracted by conflicts between war purposes and peacetime functions for which all regulatory commissions have certain statutory obligations to perform.

Because of the complexity and interdependence of the operations of the OWU *vis-à-vis* the FPC, written agreements were consummated between the two agencies defining their respective functions and providing for conference and consultation to iron out possible future difficulties. An agreement covering electric power was signed on April 24, 1942, and one covering natural gas on September 11, 1943. Similar arrangements, both formal and informal, have been worked out with other government agencies, including the FCC, BWC, State Department, Foreign Economic Administration, Combined Production and Resources Board, Department of Interior, Solid Fuels Administration for War, Petroleum Administration for War, War Department, Navy Department, Maritime Commission, War Food Administration, Office of Defense Transportation, National Housing Agency, Office of the Rubber Director, Federal Works Agency, and others.

AT times such clearances and consultations have the aspect of bureaucracy but this is misleading. It is only as a consequence of these meetings with responsible officials of other agencies that the staff of the Office of War Utilities has been able to appraise the significance of the OWU's operations in relation to the needs of other programs.

The Office of War Utilities has had the confidence and support of industry from the beginning. This has made it possible to overcome the obstacles of wartime organization. The mechanism for working with industry includes many different methods of communicating information, ideas, requests, and orders. It includes the personal visits of utility officials and manufacturers to the Washington office of OWU; visits and inspections by OWU engineers of projects under construction and of manufacturing plants; group meetings in Washington and in the key cities of each region in the country; and meetings of the fourteen OWU industry advisory committees. Representatives of utilities and manufacturers have in turn passed on to others the facts communicated to them. This has been a fully reciprocal process and the flow of information and ideas has come both from industry to OWU and in the reverse direction. The support which industry has given to OWU is due primarily to the war and to the desire of all elements in industry to contribute to the war effort. But it is due also, I think, to a recognition by industry of the disinterestedness and integrity of the OWU staff.

THE OWU has made it plain that it has no desire to regulate industry permanently. Controls are relaxed even during the war just as soon as the need for them disappears, as already witnessed in the removing of power supply restrictions in the Southeast when the 1941 drought threat ended, and similar natural gas experience in the Appalachian area during the last two heating seasons.

MOBILIZING THE UTILITIES FOR WAR



Staff of the Office of War Utilities

"PERHAPS the most important contributing factor in the development of the Office of War Utilities has been the high quality of the staff that was assembled to do the job. The men who came to Washington to join the ranks of the predecessor Power Branch and the Communications Equipment Branch were far beyond the average in ability and courage. During the early days in 1941, they endured the most disruptive working conditions."

In many instances industry has initiated actions which it would have been difficult for the government to order or administer. Power pooling is a notable example. Successful power pools are now being operated in every large, interconnected area in the country, including the Connecticut valley, New Jersey-Pennsylvania-Maryland, Wisconsin - Illinois, Indiana - Ohio-West Virginia-Kentucky, Virginia and the Carolinas, Florida, TVA-Commonwealth & Southern, Arkansas-Louisiana - Mississippi - Texas - Oklahoma, the Pacific Northwest and Northern Rocky Mountain area, and California-Nevada-Arizona. The area engineers of the Power Division of OWU helped organize some of these power pools, but all of them are operated on a voluntary basis by the utilities who are members of the pool.

The Federal government could have established these arrangements by order and placed a government load dispatcher in charge of the operation. Fortunately it has been unnecessary to take such action. It is doubtful whether equally good results would have been achieved. The pools have saved fuel and need for new capacity by the co-ordinated operation to maximize the use of hydro and high efficiency steam plants. In working out schemes for conserving our critical resources, the utility industry showed leadership of a positive character and did not sit back awaiting the guidance of government.

It is for these reasons that it is meaningless to discuss separately the achievements of the utilities and the Office of War Utilities. Their efforts have been joint and interdependent. The utilities have the full managerial responsibility

PUBLIC UTILITIES FORTNIGHTLY

for engineering, design, construction, and operation. Therefore, in the description that follows of the particulars of the OWU operating programs, it should be understood that the term OWU comprehends not only the staff of the organization itself but all of the instrumentalities of industry as well.

Office of War Utilities' Operations

THE major functions of the Office of War Utilities may be summarized under the following headings:

1. Planning major expansions of utility facilities.
2. Authorizing essential utility construction.
3. Assuring materials for necessary maintenance, repair, and operating supplies.
4. Effecting the redistribution of inventories.
5. Planning for allocations in case of shortages of utility services.
6. Scheduling production of equipment.
7. Programming requirements of utilities and manufacturers for critical materials.
8. Coördinating conservation of fuel and utility services.

1. Planning Major Expansions of Utility Facilities.—An adequate amount of capacity has been installed so that power demands have been met in all sections of the country. At the same time there have been no unnecessary installations, no installations representing an unsound diversion from the remainder of the war program. This result was not accident nor good fortune. It resulted from painstaking and remarkably precise estimates by the Power Division of capacities and war loads for each power supply area and subdivisions of areas

and the coöperation of the industry in proceeding with the construction and other arrangements necessary to meet the indicated deficits. The precision of the planning was the consequence of a stupendous amount of detailed work and combined consideration of many seemingly unrelated factors.¹

Planning of additional facilities to meet war loads was similarly conducted for wire communications, natural and manufactured gas, and water utilities. The 1,200-mile Appalachian natural gas pipe line from the gas fields of Texas and Louisiana to West Virginia was held up until the magnitude of the gas shortage justified diverting from military production the considerable quantity of steel pipe, compressors, and other critical material involved.

2. Authorizing Essential Utility Construction.—Administering a system for authorizing and assigning priorities assistance to utility construction is a challenging and tremendously difficult task, not only because of the physical volume of the detailed work

¹ These factors included new loads imposed by extraction of ores and reduction of ores to base metals for the aluminum, magnesium, and steel industries; the power demands of thousands of new and expanded industrial plants; loads originated by various military and naval establishments; war housing and other new civilian activities; allowances for longer shift operation of factories; some reduction in non-war civilian loads; movements in population; reliance on lower margins of reserve capacity; the possibilities of interconnections, coördinated operation, scheduling maintenance shut-downs on an area basis; legislation for daylight saving time throughout the year; possible use of floating power plants of which four 30,000-kilowatt units were authorized. Data for these analyses were drawn from a wide variety of sources: compilations of the Federal Power Commission, load projections by utilities, plans of the military forces, the metal industries, and many others within or related to the War Production Board.

MOBILIZING THE UTILITIES FOR WAR

involved, but also because of the dual and sometimes conflicting responsibilities of permitting all utility construction essential to the prosecution of the war and of diverting the largest quantity of materials to direct war purposes.

At the start there were no rules. The only guide was the fundamental purpose of the process, to make materials available for national defense. There were soon developed, however, some general principles to guide the staff in processing applications. The most important of these are: the test of essentiality, the rule against duplication of facilities, and the rule that service should be furnished by the facilities which require the least use of critical materials. This policy sometimes causes real headaches for the OWU staff but it has paid big dividends in conserving resources for the war.

At the very outset it was evident that if construction jobs of minor size were required to be submitted for authorization in the same manner as major projects, the savings in materials would be more than offset by the burden of paper work on both the utilities and the Office of War Utilities. Accordingly, utilities are given authorization, under the "U" order applicable, for plant additions of modest cost providing certain prescribed conditions of essentiality and conservation are met.

It was also recognized in 1941 and early 1942 that requests for utility service by new customers under wartime conditions would reach record proportions and that many of these requests would not be of an essentiality to the war which would justify the use of critical materials at the expense of war demands or the endangering of service to existing customers where the capacity of existing facilities was almost reached. Accordingly, rules were adopted by the Office of War Utilities defining the conditions under which new customers may be connected and requiring application to OWU for waiver of the rules where the customer or the utility feels an exception is merited. These provisions, contained in Utilities Orders U-1, U-2, and U-6, are well known to the industries. The policy of the Office of War Utilities is to make the administration of these restrictions as simple as possible and accordingly the conditions prescribed are changed as frequently as the situation as to critical materials makes such changes advisable. The consequence of this policy is to eliminate much of the filing of exceptions formerly necessary.

In the telephone industry it was necessary to order the discontinuance of manufacture of telephone instruments for civilian uses in order that the accu-

“THE success of the Office of War Utilities in working out harmonious relationships with other governmental agencies having responsibilities with respect to utility operations has . . . been something of an achievement, considering such diverse bodies operating in the same general field as the FPC, FCC, SEC, BWC, TVA, REA, Army Engineers, Reclamation Bureau, and regulatory commissions in some forty states.”

PUBLIC UTILITIES FORTNIGHTLY

mulated inventories of instruments, other than the most modern type, could be put to use and in order to make available the facilities of the manufacturers for the production of military items, especially radio and radar equipment. Because of the shortage of telephone instruments, consequent on the stopping of production, and because of increases in demand for telephone service in congested war production centers, Utilities Order U-2 was issued to regulate new installations of telephone service. Recently it has been possible to authorize limited resumption of production of telephone instruments, but it will be many months before the accumulated demand can be fully met. Furthermore, there are many cities in which shortages of central office facilities or outside plant exist because of restrictions placed on installation of such facilities. Accordingly, the provisions of Order U-2 directing priority in furnishing telephone service to essential users must continue.

The magnitude of the task of processing applications is indicated by the fact that for 1943, total correspondence for the entire OWU amounted to 582,000 items, representing 140,000 priority applications, 82,000 appeals from limitation orders, and 360,000 letters.

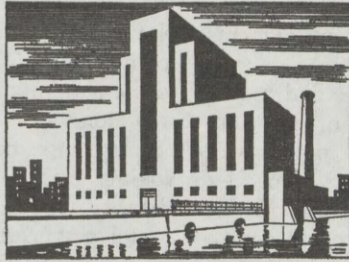
3. *Assuring Materials for Necessary Maintenance, Repair, and Operating Supplies.*—The job of assuring a prompt flow of materials and equipment to utilities for maintenance, repair, and operating supplies has been accomplished through Utilities Orders U-1, U-3, and U-4. These orders and their predecessors cover electric, steam heating, gas, water, telephone, and telegraph utilities. The orders have

gone through a long evolution, but the basic purposes have remained the same. These were to provide a top priority for utilities so that they could secure necessary materials and at the same time restrict the use of this priority in order to prevent the accumulation of excess inventories. Perhaps no other orders of the War Production Board have had as detailed study. Task committees of the utility industries have frequently been called in to offer suggestions as to desirable amendments.

4. *Effecting the Redistribution of Inventories.*—Because of the acute shortage of copper and the competing demands for many items of utility equipment in 1942, it was evident that a serious attempt should be made to establish a practical working minimum inventory for utilities, define as excess that part of the total inventory which exceeded the limits of practical working minimum, and effectuate the redistribution of the excess. The mechanics for accomplishing this end differed somewhat between electric, gas, and water utilities on the one hand, and telephone and telegraph utilities on the other.

In the case of electric, gas, and water utilities, originally, a catalog was made of copper wire and transformers on hand in the warehouses of the various utilities. Later the National Association of Purchasing Agents developed a plan for promoting the redistribution of excess stocks. Finally, the Office of War Utilities, with the help of the utilities and their purchasing agents, set up an Inventory Control Branch and a field organization consisting of regional utility engineers assigned to the thirteen principal field offices of the War

MOBILIZING THE UTILITIES FOR WAR



No Permanent Regulation of Industry

"THE OWU has made it plain that it has no desire to regulate industry permanently. Controls are relaxed even during the war just as soon as the need for them disappears, as already witnessed in the removing of power supply restrictions in the Southeast when the 1941 drought threat ended and similar natural gas experience in the Appalachian area during the last two heating seasons."

Production Board. Utilities are required to clear certain purchase orders with the regional utility engineers prior to placing orders with suppliers. If the regional utility engineer can locate the desired items in the excess stock of another utility in the same area, the purchasing utility is directed to negotiate with the utility holding the material.

The method followed in the case of telephone and telegraph utilities is for the Communications Division to prepare lists of excess material available in inventory and to distribute these lists widely to the industry to facilitate direct negotiation for the purchase of these items.

By these means, and also by requiring utilities to use up their own excess stocks before placing orders with suppliers, inventories were brought down by about \$75,000,000 during the period from June 30, 1942, to December 31, 1943. This reduction represents ma-

terials, labor, and shop space in the factories of the equipment producers that were saved through the redistribution activity.

5. *Planning for Allocations in Case of Shortages of Utility Services.*

—In the power field there has been no shortage during the war requiring a curtailment of service. However, in early 1942, at a time when war loads were increasing substantially and more rapidly than capacity, the possibility of power shortages had to be anticipated and the Power Branch issued Limitation Order L-94 on May 1, 1942. The order provided for integrated operation of all interconnected power facilities in each area of the country. In areas where the margin of spare capacity was low, detailed steps were worked out with utilities for dropping certain loads in an emergency in order to maintain voltage and hold the system together.

PUBLIC UTILITIES FORTNIGHTLY

Classes of exempt and nonexempt consumers were listed in the order to guide the utilities in making curtailments should they be necessary.

In the fields of natural and manufactured gas, limitation orders comparable in purpose to L-94 in the power field have been issued. Order U-7 (formerly L-31) is the order applicable to natural gas utilities, and Order L-174 to manufactured gas companies. These orders, in addition to prohibiting new space-heating installations in areas where supply is tight and requiring the review of new industrial applications, provide for an orderly sequence of curtailment during periods of gas shortage. The curtailment provisions have frequently been applied during periods of winter peak consumption. The orders have assured a continuous supply of gas to the top priority war consumers at the expense of the less essential users of service.

While it has not been necessary to curtail service by water utilities, the Office of War Utilities has participated in local "save water" campaigns where water supply has been short.

In the telephone industry the efforts to reduce the load on local and long-distance facilities have been principally by publicity campaigns conducted by the industry itself.

6. Scheduling Production of Equipment.—At the beginning of the emergency the United States was not immediately prepared for the unparalleled Navy and Maritime construction program. Initially there was more direct conflict between the power generating equipment and the turbines required by the Navy and Maritime Commission than for any other single class

of industrial production. The Office of War Utilities cooperated with the Navy and Maritime Commission by releasing the facilities of manufacturers to the maximum possible extent. This was done by refusing priorities for power plants and by suspending or revoking priorities previously issued. Priority applications were canceled for a total of approximately 5,000,000 kilowatts of generating capacity.

The Office of War Utilities had to adopt a "tough" attitude in reviewing its own power expansion program. Every project was reviewed from the standpoint of its necessity and relative urgency, and approval was given only where the facts disclosed the existence of a critical situation and where power required for the war effort could not be made available without the new facilities requested. The conflict between the power program and the Navy and Maritime programs was particularly sharp in the case of small and medium-size power units up to about 10,000-kilowatt capacity because the facilities for producing these units could most readily be devoted to the manufacture of marine turbines. The total amount of power plant equipment for the Navy and Maritime Commission is truly staggering.

A BATTLESHIP of the *New Jersey* class requires approximately 200,000 horsepower of turbine capacity for all purposes. A large aircraft carrier requires about 180,000 horsepower, and a light cruiser about 100,000 horsepower. Main propulsion turbines of cargo vessels, such as the new victory ships, are rated at 6,000 horsepower. Turbines and engines delivered to the Navy and Maritime Commission for

MOBILIZING THE UTILITIES FOR WAR

shipboard use during the year 1943 had a *total capacity of approximately 40,000,000 horsepower*. It is interesting to note that at the present time the capacity of the main propulsion units of all types for the Navy is approximately equal to the total installed generating capacity in all power plants in the United States.

Early in 1942 the Office of War Utilities developed turbine-scheduling order M-76, which was the first order board scheduling regulation to be issued by the War Production Board. Subsequently, scheduling orders L-117, M-293, etc., were issued covering all types of heavy utility equipment, including boilers, condensers, switchgear, and related electrical equipment. These orders provided four important advantages: (1) The schedule of the manufacturers was fixed or frozen for production so that the manufacturer could plan his work well in advance and output could be maximized; (2) prior to freezing manufacturers' schedules a careful study was made of the relative urgency of all orders placed with the manufacturer, individual consideration being given to each order; (3) the Office of War Utilities, in coöperation with the military and nonmilitary claimants, achieved a spreading out of

orders to equal the backlog on the books of the various manufacturers and to promote subcontracting; (4) this method provided almost absolute control of production, being particularly suitable for meeting the emergencies.

SCHEDULING of production was particularly important because of uncertainty with respect to long-term requirements of most claimants. For example, in the spring of 1942, no one knew precisely how much steam would be required for the synthetic rubber program or how many mechanically driven turbines would be required by the aviation gasoline program. Hydro turbines interfered with extrusion presses for aluminum. Oil circuit breakers and switching equipment interfere with switchgear for ship use. Radio and radar transformers interfere with distribution transformer production, etc.

The scheduling job from the very start has meant working in intimate relationship with the Office of Lend-Lease Administration in development of technical studies and power programs for equipment delivered pursuant to First, Second, and Third Russian Protocols, and with Treasury Procurement in following these projects through to completion. This equip-



T"THROUGH improved design and engineering practice, through wide interconnection and coördination of facilities, through unique resourcefulness in overcoming the countless handicaps which war conditions impose, the utility systems have made good their pledge that service would never be too little or too late. By economizing to the limit in the use of materials, equipment, man power, and fuel, the job has been done without interference with the urgent military programs which depend for their execution on the same scarce resources."

PUBLIC UTILITIES FORTNIGHTLY

ment includes power plants of all types, industrial boilers, truck-mounted Diesels, power trains, and many other items of power equipment. Likewise, there has been the job of providing power plants for China and all the rest of our Allies, as well as preparing for the contingencies which may arise by future military operations.

The problem of scheduling and production control is not at an end. In fact, as soon as one type of bottleneck problem is solved, new ones arise. To the manufacturers of the country should go the credit for the achievements which have been made in this field. Their coöperation has been complete in every respect and detail. They have been ready, willing, and anxious at all times to help accomplish that which was in the best interest of the war effort.

7. Programming Requirements of Utilities and Manufacturers for Critical Materials.—Part of the job of the War Production Board is to interrelate all of the war programs within the limits of our materials capacity. This job is carried out within the War Production Board by the Program Vice Chairman, who is also Chairman of the Requirements Committee. The Office of War Utilities is established as a claimant agency and as such has membership on the Requirements Committee. Other members are the Army, Navy, Maritime Commission, and the major nonmilitary claimants. Each of the claimants presents claims for its programs stated in terms of tonnages of steel, aluminum, copper, and other materials. The national supply of these critical materials is compared with the total of the several claims, and down-

ward adjustments are made in the programs to bring supply and requirements into balance. This is the essential part of the planning mechanism known as the Controlled Materials Plan. The information on military and indirect military programs is brought to a final synthesis at the Requirements Committee. It is through this mechanism that knowledge is obtained as to *which* resources are really critical, *which* areas require additions to capacity, and *which* programs must be cut if supplies are short. The application to the field of utilities of program changes brought about ultimately by changes in the strategy of the war is the fundamental part of the job.

8. Coördinating Conservation of Fuel and Utility Services.—As a measure to conserve fuel, the Office of War Utilities sponsored a national conservation campaign in the fall of 1943. All fuel-using utilities joined in this campaign and devoted their advertising resources to the problem of fuel conservation. It is obvious that an intensified drive for fuel conservation will be necessary this fall.

The Office of War Utilities has been active in furthering the establishment and retention of war time (daylight saving time the year round). This measure, which was adopted by Congress in January, 1942, has reduced peak loads in the country by about 1,500,000 kilowatts and saved annually the generation of about 1,500,000,000 kilowatt hours. This energy saving is equivalent to 1,000,000 tons of coal per year.

CONCLUSIONS.—Frequent reference has been made in the foregoing

MOBILIZING THE UTILITIES FOR WAR

to the distinctive organization personality of the Office of War Utilities, and to the high caliber of the members of the staff. These achievements were very largely due to the leadership of Lieutenant Commander J. A. Krug, who served as the original Chief of the Power Branch and as Director of the Office of War Utilities until April 18, 1944, when he left the War Production Board for active service in the United States Navy. Krug was personally responsible for the recruitment of the staff and the establishment and execution of sound operating policies. Many individuals have participated in this work, and it is not possible here to describe the contributions of each.

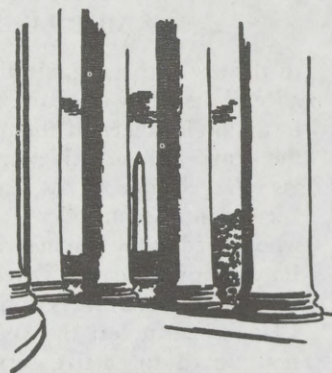
The important fact is that no war plant has ever been held up because of lack of service. Utility systems have provided all of the facilities needed by every factory and by every military and naval establishment. At the same time,

they have carried their regular civilian loads. To do this, it has been necessary to increase installed capacity and to operate both old and new capacity at abnormally high load factors and for unusually long hours.

Through improved design and engineering practice, through wide interconnection and coördination of facilities, through unique resourcefulness in overcoming the countless handicaps which war conditions impose, the utility systems have made good their pledge that service would never be too little or too late. By economizing to the limit in the use of materials, equipment, man power, and fuel, the job has been done without interference with the urgent military programs which depend for their execution on the same scarce resources. The employees and the managers of the country's utility systems deserve the highest esteem of the nation for this remarkable performance.

Washington and the Utilities

What Government Should Do In the Energy Crisis



Editor's Note: The legislative situation in Washington is fluid. Events concerning energy are outpacing even daily newspapers. In this situation, rather than discussing specific bills and events as normally done in this space, it was felt the FORTNIGHTLY could make a better contribution by opening a discussion relating to the basic thrust of that legislation: How government should approach rationing and allocation of fuels. A logical place to begin is to explore some of the lessons of the past when the supply of energy was threatened. We contacted Edward Falck of Washington who was Director of the Office of War Utilities from 1943 through 1945. His views, which follow, reflect not only experiences of that earlier "energy crisis" but also his strong, personal advocacy of how government might approach the present dilemma. The FORTNIGHTLY invites letters and opinions from others toward the end of helping government formulate a program that will have the least deleterious impact on people's lives, the economy, and utilities. Above all, to help government obtain a program that will work.

By EDWARD FALCK

I HAVE been asked to express my views on how government might approach the problems of rationing and fuel allocation in today's energy crisis, based on my experience with the Office of War Utilities. There are similarities between the fuel supply problem then and now. But there are differences, too. In order to provide the necessary rationale for my conclusion that a new government agency is needed, it is necessary to recall briefly those earlier times, the atmosphere, and my own role.

The war between Germany and Britain, France, and their allies was in full swing in 1940 and early 1941. President Roosevelt was concerned with defense mobilization in the event the United States might become involved. The Office of Production Management had been created.

One question of major concern was the "readiness"

of the electric industry to meet power requirements in the event of war. The President had asked for a report on this important subject and one was prepared and presented by Mr. Kellogg of the Edison Electric Institute and Gano Dunn, a well-known engineer. The Roosevelt advisers believed this Kellogg-Dunn report was too conservative and did not allow for probable contingencies that might greatly expand the requirements for electric power. At this point, President Roosevelt called upon Julius A. Krug, then manager of power with the Tennessee Valley Authority, to come to Washington. Mr. Krug, called "Cap" by his friends, asked me to leave my work with Consolidated Edison Company of New York, Inc., to come to Washington as a "Dollar-a-year man" and be his deputy.

Needs Estimated

My first assignment was to forecast the peak electric power requirements that would occur under conditions of full military and civilian mobilization. In this work I had the highly competent assistance of an able statistician, Constantine Bary, who had been loaned by Philadelphia Electric Company. We estimated power requirements would peak in the year 1943 at a level very substantially higher than had been predicted in the Kellogg-Dunn report. Immediate steps were taken to expand the hydroelectric capacity of TVA and the Bonneville Power Administration and also to expand the steam power-electric generation capability of important private power systems serving defense production loads.

The Office of War Utilities had a quality organization of men and women. Their morale was always high. No one complained when we called upon our staff to work long hours. Everyone knew "there was a war on." (Government workers today exhibit no such knowledge toward the energy crisis.)

Our personnel was recruited with great care to balance out conflicting points of view. We drew manpower from privately owned electric companies, federal agencies such as TVA, Bonneville Power,

Federal Power Commission, and Rural Electrification Administration. We made every effort to prevent the use or abuse of the priorities-allocation system to further the special interests of any particular company, public *versus* private ideology, etc.

We gave much thought to avoiding conflicts of interest. Judge John Lord O'Brian, who was general counsel of WPB, set up guidelines that helped keep the entire operation of WPB above suspicion and beyond wrongdoing. First, it was a rule that no Dollar-a-year official could pass on priorities or allocations affecting his own industrial or utility company. Secondly, all top policy determining jobs were held by governmental employees on the government payroll. No Dollar-a-year man could make any important policy decision. (When I accepted appointment to be Deputy Director of the Office of War Utilities in 1943, I was forced to resign my job with Consolidated Edison and go on the federal payroll.)

Political Climate

The political climate in 1941-43 was very different than it is today. Although a small minority of right-wingers were strongly opposed to President Roosevelt and even accused him of conniving to induce the Japanese attack on Pearl Harbor, the vast majority of Americans were solidly behind the President and the war effort against Nazi Germany and Japan. There was little or no dissent when Americans were called upon to accept gasoline rationing and electric dim-outs.

We did not fear the political effect of decisions to restrict public consumption of energy for nonessential purposes. For example, we prohibited use of outdoor lighting for advertising, display, and ornamental purposes. We prohibited night baseball and football games. We turned the lights off on Broadway. Today, one may wonder whether the government will go this far in an effort to balance energy requirements with available energy supply.

It may be noted that unless nonessential uses of electricity are curtailed, there will inevitably occur power shortages which will force the cutting off of electric service to essential, even vital, uses such as schools and hospitals.

What is needed first is establishment of categories of essential uses and categories of nonessential uses. To do this involves the making of top-level value judgments in terms of the national public interest. Consideration must be given to the impact of electric power curtailment upon national defense, industry, trade, and employment.

Burden Borne Equitably

Also, a balance must be sought between and among power supply areas throughout the country. The power shortage should be shared insofar as possible on an equitable basis.

During World War II we acted on the basis of judgment and common sense without the benefit of lengthy time-consuming studies, reports, hearings,

and debates. Today we have had too many studies and hearings and not enough decisive action.

Governor Love has stated many times that priorities solve no supply problem; they merely allocate the shortage. I agree with this generalization. The only way to solve an energy shortage is to increase energy supplies and cut off or dampen energy requirements. Shifting energy requirements from natural gas to propane or to fuel oil and from fuel oil to coal does nothing to cure the overall energy shortage. We must find ways quickly to increase production of all our hydrocarbon resources, coal, oil, and natural gas. This will take time. Meanwhile, we must have curtailment and rationing.

Asks Bold Action

One of my few criticisms of Governor Love and his staff is their reluctance to proceed boldly with mandatory fuel curtailment and rationing. There has been too much table tennis between the administration and the Congress as to which branch of government would be willing to take the political heat for inaugurating these something-less-than-popular rationing programs.

There are ageless imperatives which it would do no harm for the current generation of regulatory writers to learn. Among these are: that nonessential and less essential uses of energy or other scarce resource must be prohibited with sanctions against violators and broad enforcement. Another rule is that the regulations must be written in understandable English. A third, perhaps most important, is that the philosophy behind the regulations must be one of reasonableness and fairness so that the public will be convinced of their equity and will help in their enforcement. This means the regulations must be equitable as among groups; viz., labor *versus* management; large *versus* small business; rural *versus* urban populations, etc.

Sees Earnings Holding Up

I do not think the energy shortage will result in a sharp decline in electric utility sales or earnings. The shortage may cause a shifting of demands during the day and the seasons of the year that will improve average annual load factor. Also, the shortage of natural gas and house-heating oil is bound to result in greater use of electric service—even in spite of the well-known fact that converting oil or gas into electricity is less efficient, thermally speaking, than using the same oil or gas directly for thermal applications.

If electric utilities can increase their winter (off-peak) sales and decrease their summer (on-peak) sales, their annual load factor will improve. As for increased cost of coal and oil for generation, most electric utilities have fuel escalation clauses in their commission-approved rate schedules, so that they are fairly well protected from the inflation in cost of purchased coal and oil.

What is much more important, as a threat to future net income of privately owned electric utilities, is

the necessity to replace old low-interest bonds and debentures with new securities bearing very much higher interest rates and more onerous provisions for amortization of the principal of such new issues.

The Office of War Utilities was created by the chairman of the War Production Board, with the approval of President Roosevelt, as an autonomous agency, within the War Production Board. The President of the United States had delegated to the chairman of the WPB the mobilization authority which Congress had given to the President. The WPB chairman, in turn, delegated to the Director of the OWU such authority as was necessary to regulate and control the utility industries.

Worked with Manufacturers

In addition to planning and implementing the expansion of these industries to meet wartime requirements, the OWU had responsibility for allocating and scheduling the manufacture and delivery of critical components such as steam and hydraulic turbines, large boilers, transformers and switchgear, etc., to meet the more urgent defense requirements in the U. S., Canada, United Kingdom, Soviet Russia, and other allied countries.

The authority of the OWU was plenary. It transcended the authority of the Federal Power Commission, the Department of the Interior, the TVA, and so on, insofar as priorities, authorization of new construction, and allocation of service were concerned. This temporary eclipse of peacetime agencies was essential in order to have a central, fast decision-making authority to help achieve the national purpose in record time. The OWU co-operated to the fullest extent and under conditions of maximum secrecy and security to mobilize the electric power resources needed for the production of the atom bomb. This was then known as the "Manhattan Project."

Lessons for Today

What lessons might be gained from the procedures adopted by WPB that might be helpful today in solving the energy crisis?

The first lesson it seems to me that we learned in operating the Office of War Utilities was the great importance of having a staff of individuals who were competent, objective, and dedicated. The second lesson was the importance of having available all the relevant information and statistics needed to make major decisions on an objective basis of fact. A third lesson was the absolute necessity for centralizing authority and responsibility in a single agency that could operate with speed and decisiveness.

We felt strongly then, as I do now, that the regulatory agencies, such as the Federal Power Commission, should not be used because their method of operation under the Administrative Procedure Act, requiring as it does public hearings, interventions, court appeals, etc., is too time-consuming. In times of emergency, we cannot afford the luxury of such snail-paced regulatory decision making.

As an example, I might mention the current history of FPC approvals for new projects involving the importation of liquefied natural gas (LNG). The Columbia LNG proceeding before FPC required more than four years between the date of initial application and final FPC approval. I am not suggesting that FPC is entirely at fault. There were adversary interventions by environmentalists and others. Energy shortages require a faster system of decision making.

Advocates New Agency

The fourth lesson is that we urgently need in government at a very high level an agency that can perform affirmative functions in beefing up power supply and energy resources. Such an agency should have broad responsibility for planning and co-ordinating major expansions of energy facilities, working co-operatively with both private industry and public groups. It should have the authority to schedule production of equipment and also authority to break bottlenecks that are interfering with the progress of any authorized energy program. Such an agency should be able to issue necessary directives to other departments of government that may be delaying the rapid completion of any new energy project or program.

It is fortunate that the U. S. has received an "early warning" signal of Arab intentions and ultimate use of oil as a political and/or military weapon in world affairs. The answer by the United States, an answer often suggested in Congress by Senator Jackson (Democrat, Washington), is to make the United States as self-sufficient as possible and as quickly as possible. As soon as we attain that goal, we can happily purchase all of the crude oil that the producing countries agree to sell to us. Even if there is a peace treaty signed between Israel and the Arab countries, we should be on guard with respect to future dependence on the Middle East oil supplies.

I would recommend setting up an agency of government that would push ahead vigorously to aid business and industry to increase energy supplies and electric power-generating capacity. Today, most of our federal agencies have jurisdiction to stop or veto new projects; e.g., Federal Power Commission or Environmental Protection Agency. However, the value judgments as to which industry or class of consumer should receive power or fuel and which should be cut off cannot be made either by the energy companies themselves or by any government energy department. Such decisions affect national security, national defense, Gross National Product, employment, and the public interest in its broadest significance.

That is why I recommend re-establishment of an Office of Emergency Preparedness or a National Security Resources Board. Such an office or board would report directly to the President and to a joint committee of Congress as well. Only such an agency would have the capability of setting national goals, national priorities, and values.

CHAIRMAN
HENRY H. FOWLER
VICE CHAIRMAN
W. RANDOLPH BURGESS
LIVINGSTON T. MERCHANT
LAURIS NORMAN
THEODORE C. ACHILLES
EUGENE V. ROSTOW
ALEXANDER S. TROWBRIDGE
T. J. URER
RICIVAL F. BRUNDAGE

SECRETARY
TOM KILLEFER
DIRECTOR GENERAL
RICHARD J. WALLACE

DIRECTORS

DONALD G. AGGER
FRANK ALTSCHUL
GEORGE W. BALL
JANANN G. BAKER
EDWARD W. BARRETT
FRANCIS M. BATON
JUSTIN BLACKWELDER
W. MICHAEL BLUMENFELD
LANDRUM R. BOLLING
GENE BRADLEY
WILEY T. BUCHANAN, JR.
WILLIAM A. M. BURDEN
HODDING CARTER, III
MARLAN CLEVELAND
EMILIO G. COLLADO
RICHARD N. COOPER
FREDERICK L. DEMING
ROBERT L. DENNISON
DOUGLAS DILLON
WALTER DOWLING
ROBERT ELLSWORTH
BROOKS EMEY
SHERWOOD L. FAWCETT
THOMAS K. FINLETTER
WILLIAM C. FORSTER
GEORGE S. FRANKLIN, JR.
RICHARD N. GARDNER
CARL J. GILBERT
ALFRED M. GRUNERTHER
J. GEORGE HARRAR
LIVINGSTON HARTLEY
WM. ROGERS HEROD
CHRISTIAN A. HERTER, JR.
JOHN D. HICKERSON
CLAIRE GIANNINI HOFFMAN
J. ALLAN HOVEY, JR.
THOMAS L. HUGHES
HENRY M. JACKSON
JACOB K. JAVITS
O. B. KIERNAN
R. A. KISSINGER
JOHN M. LEDDY
LYMAN L. LEMNITZER
WALTER J. LEVY
MARY P. LORD
JAY LOVESTONE
DAVID W. MAGEACHRON
JOHN J. MCCLOY
J. B. MEDONNELL
LAWRENCE C. MCGUADE
HARALD B. MALMGREN
WM. HUGHESNEY MARTIN
GEORGE MEANY
SAMUEL W. MEER
JOHN M. MEYER, JR.
HOWARD MORGENSE
WALDEN MOORE
MALCOLM MUIR
ROBERT D. MURPHY
FREDERICK E. NOLTING, JR.
GARRISON NORTON
LITHGOW OSBORNE
HENRY D. OWEN
DAVID PACKARD
PETER G. PETERSON
H. H. PORTER
OSGOD R. REID
EMMETT J. RICE
OLIN ROBISON
WILLIAM P. ROGERS
SIDNEY E. ROLFE
ROBERT V. ROOSA
R. CHAPMAN ROSE
NATHANIEL SAMUELS
J. ROBERT SCHAETZEL
ADOLPH W. SCHMIDT
CORTLANDT V. R. SCHUYLER
GERARD C. SMITH
KENNETH M. SPANG
TIMOTHY W. STANLEY
RALPH I. STRAUS
ELLSWORTH TOMPKINS
PHILIP H. TREZISE
JOHN W. TUTTILL
FRANCIS O. WILCOX
PATRICIA M. WILCOX

THE ATLANTIC COUNCIL OF THE UNITED STATES

1616 H STREET, N.W. • WASHINGTON, D. C. 20006

TELEPHONE 347-9353
CABLE: ATCOUN

EMBARGO

For Release:

Wednesday, January 15, 1975

A CALL FOR LEADERSHIP

Report of Working Group III
of the Atlantic Council Committee on Energy Policy

Charles F. Adams
Chairman of Working Group III

E. Keith Thomson
Rapporteur

Richard R. Harbert
Assistant Rapporteur

Members of Working Group III

Theodore C. Achilles
W. Randolph Burgess
Emilio Collado
John P. Fishwick
John E. Gray
Joseph W. Harned
Parker T. Hart
Tom Killefer
Walter J. Levy
Cecil J. Olmstead
Taylor Ostrander
David Packard
Hoyt Price
Dr. Simon Ramo
Nathaniel Samuels

A CALL FOR LEADERSHIPCONTENTS

Page

	Foreward by Henry H. Fowler	
I.	Introduction	1
II.	Cause and Effect	3
III.	Reducing Energy Dependence	4
IV.	International Coordination and Cooperation	9
V.	Conclusions	11
	References	

FOREWARD

In January of 1974, the Atlantic Council established an Energy Policy Committee to consider the problems of national coordination and international cooperation in the field of energy. During the second half of the year, three task forces carried out detailed inquiries into the financing of energy supplies, alternatives to imported oil and gas, and accelerated development of these and other conventional energy resources.

The year just past has seen extraordinary outpouring of facts and forecasts, news and opinion, options and scenarios about the interlocked complications that make up the "world energy problem". Major reports have issued during 1974 from the Ford Foundation, the Committee for Economic Development, the Trilateral Commission, and the Federal Energy Administration (on "Project Independence"). The Atlantic Council task groups have also been able to draw on a massive compendium of statistics and analysis by the Organization for Economic Cooperation and Development. Important additions to this literature have come from Legislative hearings and Executive speeches, and from journals, weekly newsmagazines and daily newspapers.

It is clear that the abrupt ending of the era of cheap energy and concomitant changes in the financial situation of many nations constitute not only serious dangers for the world's trade and payments systems but also for the cohesion of the democratic industrialized nations upon which their security and prosperity depend. As the basic purpose of the Atlantic Council

is to contribute toward more effective cooperation and cohesion between these countries, the present situation is naturally of concern to it.

Another scholarly research report would be redundant. But the Atlantic Council's mode of work is not basic research; it is policy analysis. Our purpose here is to suggest the framework of U. S. action which would best reflect and express the interdependence of U. S. decisions with those of other nations, especially our closest allies in the "Community" of industrial countries which now extends across the Pacific as well as the Atlantic.

I take pleasure in presenting herewith a preliminary paper by the Hon. Harlan Cleveland for the Council's Steering Committee on Energy and one by E. Keith Thomson and Richard R. Harbert for its Working Group on accelerated development of conventional resources. These papers have been written in the light of the discussions of the Steering Committee and the Working Group. While the final responsibility for the views expressed is that of the authors, the Council is pleased to present them for public discussion and debate.

A list of the members of the Steering Committee follows.

Henry H. Fowler
Chairman

Members of the Atlantic Council Energy Steering Committee

Chairman:

Hon. Henry H. Fowler - Partner, Goldman, Sachs & Co.; Former Secretary of the Treasury; Chairman, Atlantic Council

Rapporteur:

Hon. Harlan Cleveland - Director, Aspen Program in International Affairs; Former Assistant Secretary of State, Former Ambassador to NATO; Director, Atlantic Council

Members:

Hon. Theodore C. Achilles - Former Counselor of the State Department and Ambassador; Vice Chairman, Atlantic Council
 Mr. Charles F. Adams - Chairman, Raytheon Company
 Hon. W. Randolph Burgess - Former Under Secretary of the Treasury; Ambassador to NATO and OEEC; Vice Chairman, Atlantic Council
 Mr. John Campbell - The Trilateral Commission
 Mr. Emilio Collado - Executive Vice President, Exxon Corporation; Director, Atlantic Council
 Dr. Sherwood L. Fawcett - President, Battelle Memorial Institute; Director, Atlantic Council
 Mr. John P. Fishwick - President, Norfolk and Western Railway Company
 Mr. John E. Gray - Energy Consultant
 Mr. Joseph W. Harned - Assistant Director, Atlantic Council; U.S. Representative, Atlantic Institute
 Hon. Parker T. Hart - Special Representative for the Middle East and North Africa, The Bechtel Corporation; Former Ambassador and Assistant Secretary of State for Near Eastern and South Asian Affairs
 Mr. Peter Hoffman, Battelle Memorial Institute
 Dr. John E. Kircher - President, Continental Oil Co.
 Mr. Tom Killefer - Vice President, Chrysler Corporation; Secretary, Atlantic Council
 Mr. Walter J. Levy - Energy Consultant
 Hon. William McChesney Martin - Former Chairman, Board of Governors of the Federal Reserve; Director, Atlantic Council
 Mr. Cecil J. Olmstead - Vice President, Texaco, Inc.
 Mr. Taylor Ostrander - Assistant to the Chairman, American Metal Climax, Inc.
 Hon. David Packard - Chairman of the Board, Hewlett-Packard Company; Former Deputy Secretary of Defense; Director, Atlantic Council
 Mr. Hoyt Price - Director, Information Research Division, Gulf Oil Company
 Dr. Simon Ramo - Vice Chairman of the Board, TRW, Inc.
 Dr. Sidney E. Rolfe - International Economist; Director, Atlantic Council
 Hon. Robert V. Roosa - Brown Brothers, Harriman and Co.; Former Under Secretary of the Treasury for Monetary Affairs; Director, Atlantic Council
 Mr. P. N. Ross, Manager, Power Systems Planning, Westinghouse Electric Corporation
 Mr. Nathaniel Samuels - Kuhn Loeb and Company; Former Under Secretary of State for Economic Affairs; Director, Atlantic Council
 E. Keith Thomson - Vice President, Bechtel International Services Corporation
 Mr. Richard J. Wallace - Director General, Atlantic Council

A CALL FOR LEADERSHIP

An Approach Toward Resolution of Energy
Problems Through International Coordination and CooperationINTRODUCTION

The mainstay of a modern industrial nation is its ability to secure and use energy resources. The current uncertainty of oil cost and supply from the Middle East to the oil importing nations of Japan, Europe and the United States is contributing to severe world wide economic problems. The economic tensions are, in turn, reducing confidence in the leadership of the Western nations. It is imperative that decisive coordinated action be taken to establish stability in the world's energy market place.

A potential oil embargo, worldwide inflation, shortages of food and water, an economic recession, and the precariousness of the international financial system confront the industrial powers of the world. No single nation alone can hope to resolve any of these problems, yet the solutions must begin with the internal policies of the individual nations themselves. While it cannot dispell all the world's crises, the stability of the energy situation is the most important single factor. We believe the United States should take decisive action on the energy issue which would be consistent with its leadership role in world affairs.

The United States has more options to reduce demand for Middle East petroleum than any other nation by virtue of its high energy consumption, its land mass, its geology, its climate, and its natural endowment of resources. Therefore, there is an obligation of the United States to capitalize on this advantageous position and reduce its dependence on Middle East petroleum so as to minimize its vulnerability to the threat of another oil embargo. This commitment to greater energy independence would strengthen the United States in its negotiations with the oil-exporting countries and would reassure its allies, whose position would be strengthened also by a vigorous U. S. policy.

In order to reduce the U. S. dependence on imported oil, domestic energy supply must be increased and energy demand must be decreased. This twofold approach can constitute a national energy policy only if the U. S. Government is determined to take the immediate action necessary. Attempts must be made to improve all domestic sources of energy, and the market place will determine the most viable fuel mix.

-2-

The primary obstacles to increasing domestic supply of oil, gas, coal, and uranium are conflicts in public policy. Therefore, the executive branch must take the position of an arbitrator and resolve these conflicts. If the President and his Cabinet do not make the difficult decisions on these choices, attempts at substantially increasing energy supply will continue to be frustrated. Due to the lead time required to bring additional domestic energy sources on line, energy demand must be reduced through a serious long-term national program to conserve energy. Effective conservation of energy must rely primarily on economic and regulatory actions by government supplemented by voluntary efforts. This requires decisive Government leadership.

A successful program by the United States in reducing its dependence on imported oil will set an example for all oil importing nations to follow. Other countries do not enjoy the same advantages that the United States has, but they can all take steps to reduce their dependence on imported oil. U. S. leadership can help them greatly.

In addition to these important efforts, we suggest a five point plan for international cooperation and coordination, the first three of which to be achieved through the International Energy Agency:

1. develop an integrated emergency program among oil-importing countries to reduce consumption and share supplies if an oil embargo occurs;
2. encourage technology, material, and capital to be made available to engage in joint energy development endeavors among the oil-importing countries;
3. promote joint research and development of alternative sources of fuels, increased energy efficiency, along with improved pollution abatement equipment;
4. develop strict safeguards on nuclear power plants to prevent a proliferation of nuclear weapons; and,
5. offer assistance to the number of developing countries that do not have sufficient domestic energy resources to spare them from bankruptcy and the drastic consequences that would follow.

Through this multilateral approach, there is hope for successful examination and resolution of the difficult problems surrounding the global development and distribution of energy.

The intention of this statement is to offer recommendations for the United States in the context of the industrialized world and its relations with the oil-exporting and other nations, for addressing the current and near future problems that result from meeting global energy needs. The Atlantic Council firmly believes that current economic and energy tensions will require immediate decisive action on the part of the Western Governments with cooperative activity through existing international institutions particularly the new International Energy Agency in order to be peacefully resolved.

CAUSE AND EFFECT

The energy problems of the industrial world did not begin with the Arab embargo on oil during the 1973 Arab-Israeli conflict. There were much earlier indications of trouble. Worldwide energy consumption has been growing at an increasing rate. Although Americans have more than two to four times the per capita energy consumption of most industrial nations, the growth rates of energy consumption of these countries in recent years has far exceeded that of the United States.

At the same time that the United States was faced with increased competition for foreign energy supplies, domestic exploration and drilling for oil decreased. New refinery construction slowed due to changes in tax credits and other Government incentives, market uncertainties and, later, public and environmental objections.

The nuclear power industry has failed to keep up with the optimistic expansion predicted by its supporters. Nuclear power plant construction has been plagued with a cumbersome licensing process, unsuspected technical problems, labor strikes and litigation over environmental and safety concerns.

Oil spills delivered severe setbacks to production of existing offshore wells and new exploration. Environmental concern delayed pipeline construction and thus oil production from Alaska's North Slope. Regulated prices of natural gas deterred exploration and development.

The wage and price controls imposed in 1971 gradually made the United States a less attractive market for international oil companies. Further, fixed energy prices distorted the exploration, production and distribution of fuel.

Then the oil-exporting nations caused a sharp, sudden reduction in available oil supply and a quadrupling of the prices of primary fuel. Price relationships, rates of use, foreign policy and national security have become affected with uncertainty and conflict.

The dilemmas posed by the acute energy situation spurred the U. S. Government into action. The last two years have seen seven "energy czars", several government reorganizations, presidential messages, a multitude of reports, addresses, regulations, allocations, price controls, investigations, and proposed legislation thrust forward to illustrate the Government's concern. These activities create an aura of action, but, in fact, there have been few concrete accomplishments. Indecision or conflicting decisions on the part of various areas of the Federal Government, as well as state and local governments, have often resulted in major delays and increased costs for the siting and development of energy facilities. Prompt decision making from the highest office to the lowest competent level of Government is essential to an orderly and timely decision-making process by the private energy industry and the other nations of the world.

REDUCING ENERGY DEPENDENCE

While all oil-importing nations should strive to reduce the quantity of oil imports, the United States is in a position to make the greatest impact on curtailing the energy demand on Middle East oil by reducing energy consumption and increasing energy resource development. It is not possible nor desirable to reduce imports to zero. In fact, it is economically desirable that trade in energy should be continued. However, the United States, Japan and Europe should endeavor not to be heavily dependent on countries that have foreign policies ambiguous towards those of the Atlantic Community.

Because energy has been cheap and plentiful in the United States, it has been used as though there was a limitless supply. Americans use twice as much as the average Englishman, 2 1/2 times as much as the average German, and 4 1/2 times as much as the average Japanese.

This offers potential for energy savings in many areas. As indicated earlier, primary reliance for reducing demand will have to rest on legal restrictions including taxes. They can be supplemented by a carefully planned program of voluntary cooperation. Within these parameters are numerous alternatives available to reduce wasteful energy consumption and promote more efficient use of energy. One rational method, which the United States is almost the only nation not to use, is a graduated automobile tax on horsepower. Public education, building codes, minimum legal automobile mileage standards, tax restraints and other means are practicable. Many of these actions will cause an inconvenience and even a penalty on sectors of society and, therefore, will be politically and generally unpopular. But these are the type of action that must be taken by the U. S. Government in order to reduce the nation's dependence on imported oil. Effective conservation is a sacrifice that must be made and can have an almost immediate impact on energy consumption.

The United States has more domestic energy reserves to develop than any other oil importing nation. The United States has abundant coal reserves. At current levels of usage, our coal reserves could last about 800 years. Coal production has traditionally been concentrated in Appalachia, but most of the nation's reserves are in the Midwest and Northern Great Plains. Oil and gas reserves are considerably more limited. Proven reserves are less than 10 years of domestic supply. The greatest potential for new discoveries lies in the offshore areas (OCS) and in Alaska. And over the last 10 years the commercialization of nuclear electric power generation has been realized. Therefore, there are numerous domestic conventional energy sources which can be developed in the United States to offset imported oil.

The present government energy system is comprised of a complex web of separate yet interrelated policies undertaken at many levels of government. There are varying degrees of efficient cooperation and coordination between these different levels of government. Traditionally, the government is characterized by near independence among important elements of the decision-making machinery. Coordinated setting of objectives with regard to energy has been rare. Moreover, a variety of other public policies and activities have an indirect impact upon energy supply and consumption. In fact, many of the current energy supply problems are in large part an unintended by-product of governmental action in non-energy areas.

Uncertainty over Government policy continues to inhibit commitments by industry to develop these energy sources. Price controls, tax reform, licensing, leasing, surface mining regulations, and environmental and safety requirements are in a state of flux as these issues are pondered by the U. S. Congress, Departments and Agencies. Instead of decisive leadership, the Government reorganizes and the political leaders vie for the title of "energy czar". For example, prospects of the decontrol of natural gas prices could be a major cause of natural gas shortages as supplies are held back in anticipation of a possible quintupling of the price. Also, commitments for nuclear power plants are delayed due to a cumbersome licensing process, changing design standards, and an antiquated rate structure.

There are genuine environmental and consumer concerns over the development, distribution and use of energy. There are also valid concerns that if commitments are not made immediately by industry to increase the U. S. domestic energy supply, shortages and severe economic consequences may occur. The decisions that must be made by the U. S. Government cannot be agreeable to every viewpoint; some decisions will be considered unreasonable by industry and others by environmentalists. But the Government leadership must be firm, consistent, and strong in its actions. With the ground rules fixed, industry can operate among the other variables inherent in the energy field even though compounded by the uncertainty of world market prices.

The Atlantic Council supports the creation of the Energy Resources Council in the United States Government. This action recognizes the need for a body at the highest level of government to assure the implementation of Federal Energy Policy. We hope that beyond developing a single national energy policy and program that the Energy Resources Council will coordinate the policy. In order to perform this much needed function the Council will require a full-time competent staff.

Due to the complexity and size of the global energy network, this Energy Resources Council will need to be periodically appraised of the various segments, activities and programs of the energy industry. A suitable forum of informed, knowledgeable advisors is needed. The function of this forum would be that of a non-political, independent, continuing body to study and advise on the nation's competing energy and demand, and conflicting goals. It would be comprised of qualified representatives of industry, government, the public and the scientific community. A suitable forum would be the United States National Committee of the World Energy Conference.

The World Energy Conference, founded in England in 1924, is a permanent organization of leading executives, engineers, scientists and specialists, in industry and government, who are professionally concerned with the development, utilization and distribution of energy throughout the world. It is a non-commercial, non-profit organization. There are currently 67 member nations represented by individual National Committees, who actively participate in major conferences which are convened every three years. The U. S. National Committee, as with the other 66, must be representative of energy interests within defined national boundaries and have the support and participation of those persons with the highest responsibilities for development, transformation, transportation and utilization of energy. Membership embraces representation of other entities involved in energy, such as manufacturing, engineering, construction, banking, education and publications.

The U. S. efforts to balance supply and demand in the next few years will require a coordinated energy strategy which will create a minimum of short term dislocations and hardships while working in concert with long term national energy policy. Managing a transition from energy abundance to relative scarcity with minimum impact on the economy, the environment, energy prices and foreign policy objectives will be much more difficult than achieving any single goal. But the balance of these multiple objectives lies at the crux of decisive leadership at the highest level of the U. S. Government. If such guidance does not take place energy shortages during the next five years, accompanied by rising prices undoubtedly will exacerbate the initial disorder of the current energy situation.

The Atlantic Council suggests that the U. S. Energy Resources Council consider the following actions as the foremost issues on its agenda:

- OIL

Since the Federal Government controls perhaps 40 percent of the producible oil, the U. S. Government should enforce a high rate of production on current Federal leases and leasing should proceed on the outer continental shelf with proper safeguards required to prevent oil spills.

- NATURAL GAS

If natural gas prices remain regulated at current levels, the outlook for increased supplies is not promising. However, to totally deregulate the

natural gas price, or in effect allow OPEC to regulate the price, would cause an abrupt and severe financial jolt to the consumer, and unfair profits to the producer. Therefore, there should be a phased deregulation of the natural gas prices not only to reflect the rise in cost of production but stimulate a higher rate of exploration and production.

- COAL

Our Western reserves of surface minable coal should be developed immediately as the cheapest and fastest solution to our additional energy supply needs. The recently enacted state laws on reclamation give important protection to environmental interests. Any additional federal legislation should be broad in concept and aimed to permit this valuable resource to be used to help solve our energy problem. The present moratorium on the leasing of federal coal lands should be ended forthwith. U. S. Government loans should be made available to upgrade the railroads for transporting coal. Federal power of eminent domain should be enacted for coal slurry pipelines. Finally, pending legislation to amend the Clean Air Act of 1970 to provide greater flexibility without jeopardizing its health-related requirements is definitely desirable.

- NUCLEAR

The newly created Nuclear Regulatory Council should strive to eliminate licensing and regulatory delays which have contributed to setbacks in construction schedules and increased costs. The financing requirements of the electric utilities for the construction of nuclear power plants need to be closely examined and methods found, either public or private, to stimulate new capital formation.

- ENERGY FACILITY SITING

Major capital investments are required for building power generating plants, refineries, and deep water port facilities. Public intervention in the

siting of energy facilities is a major contributing factor in forcing energy development outside of the nation's boundaries. U. S. Federal and State Governments must move swiftly toward formal preconstruction certification, consolidation of the certification process, mandatory consultation with or participation of the environmental protection agencies, thorough review of a wide range of environmental factors, public notice and opportunity for public hearings, and governmental review of long-range plans.

Some of the decisions that will be made by the leadership of the U. S. Government will involve adverse environmental effects and others will impede various sections of energy development. But, the most important factor is that decisions must be made soon to clear the doubt surrounding the multitude of energy issues which have for so long been studied in Washington.

Many of the conservation measures being considered by the United States are already in force in Europe and Japan where there are not as many energy reserves to be developed. However, if the United States makes the commitment to reduce its oil imports, other oil importing nations will follow suit as best they can. It would certainly bolster confidence in a time when "doomsday" soothsayers are so prevalent.

INTERNATIONAL COORDINATION AND COOPERATION

The energy problem is so complex and vast that it cannot be dealt with by an isolated committee or bureau within the United States Government nor can it be resolved solely by isolated actions by individual countries. Coordination and cooperation are the key elements in approaching the energy problem. Five aspects of multilateral action in the energy field are recommended for the oil-importing and exporting nations of the world.

First, we endorse the steps taken by the twelve-nation Energy Coordinating Group toward the development of an integrated emergency program to reduce consumption and share supplies if an embargo occurs. We believe that the draft agreement for an International Energy Agency (IEA) signed at Brussels on September 20, 1974 provides an excellent start. It is expected to include the U. S., Canada, Japan, the Common Market Commission and all the members of the European Economic Community with the exception of France. It is hoped that Sweden, Switzerland, Australia, New Zealand and others may join. The IEA, with provisions for weighted majority voting, will be responsible for providing long-term cooperative

relations with the consuming countries and between them and the oil exporting and other importing nations, and continuing exchange of current information and emergency measures. It will be an autonomous agency of the OECD. It provides for increasing member nations' stockpiles of oil to 90-days and for practically automatic demand-restraint and oil sharing in the event of an embargo or other serious reduction in supply.

Second, advanced technology and vast amounts of material, labor, and capital are required to develop the energy reserves throughout the world. These resources are not distributed evenly by region, country, or sector. It would be counter-productive to restrict flow of these resources across borders because of nationalistic or competitive reaction. We support joint energy development endeavors, particularly among oil-importing countries, combining available technology, material, labor and capital.

Third, the need for increased efficiency in the use of energy, improved pollution abatement equipment, and rapid progress in the development of new energy resources will require a more extensive sharing of technology, and more joint research and development. Rapid progress in developing alternative domestic sources of fuel will help meet energy scarcities. Looking ahead to forms of energy which have not proven to be commercially viable (oil shale, solar power, nuclear fusion and hydrogen), governments and research institutions should pool their talents and resources in the hopes of making greater progress in scientific discovery. An example would be joint research and development of commercial solar power stations in the Middle East because of the climate, possibly using Arab financing, Western technology, European materials, and labor from neighboring developing countries.

Fourth, nuclear power is emerging as a major new source of energy. Uranium fuel may be easily transported and, thereby, will play an important future role in the international energy system. However, expansion of nuclear power poses several important problems: 1) preventing the diversion of fissionable materials to military or criminal uses, 2) assuring the safety of nuclear power plants from accidents or sabotage, and 3) ensuring safe handling of nuclear fuel and radioactive by-products. Materials from which nuclear weapons could be made are present or could be produced at several points in the nuclear fuel cycle. Despite the safeguard system established under the general supervision of the International Atomic Energy Agency (IAEA), India recently detonated a nuclear explosive produced from their nuclear power facilities. These problems are international in scope and while this panel of authors is not qualified to propose a solution through this forum, it is imperative that attention be devoted to developing peaceful uses of nuclear

energy while ensuring global protection from a proliferation of nuclear weapons.

Finally, immediate and long-term assistance should be afforded a number of developing countries that do not have sufficient domestic energy resources to spare them from bankruptcy because of the rise in oil prices together with increased prices for other essential products. Until recently, the larger industrial oil importing countries as a group have been able to meet payments for oil without serious balance of payments deficits. But now they are finding it difficult to provide assistance to the poor countries, which are suffering seriously from the increased cost of petroleum. The developed industrial nations continue to have a political and economic interest in, and a moral obligation to provide aid to those less developed countries that face economic disaster because of high oil prices. Aid through technical and agricultural assistance, emergency grants and soft loans should continue.

But the oil exporting countries with excess revenues, having greatly increased their own income, should feel an obligation to ease the plight of the affected developing nations. The methods that they should use include larger new contributions to international lending institutions, differentiated oil price system, and the provision of grants and soft loans. A number of the members of OPEC have recognized this responsibility and a beginning has been made in making funds available, but only a beginning in view of the extent of the need.

CONCLUSIONS

The United States is in the best position to reduce its demand on oil produced in countries of the Organization of Petroleum Exporting Countries through conservation measures and development of domestic energy reserves. Therefore, we recommend that the leadership of the U. S. Government take immediate decisive action to reduce its oil imports. We urge all other oil-importing nations to do the same as best they can.

Competitive, nationalistic responses to the problems of increasing energy supplies will benefit no country in the long run. Cooperation is essential -- cooperation between government and corporations, between governments of oil-importing nations, between corporations

-12-

and the governments of oil-exporting nations. The proposed International Energy Agency provides a major breakthrough for effective international cooperation on energy and related matters. The sooner it can be ratified and brought into effective operation, the better.

REFERENCES

- Campbell, John C., Carmoy, Guy De, and Kondo, Shinichi,
"Trilateral Task Force on the Political and International Implications of The Energy Crisis",
June, 1974.
- Committee on Interior and Insular Affairs, United States Senate,
"Considerations in the Formulation of National Energy Policy", U. S. Government Printing Office,
Washington, 1971.
- Committee on Resources and Man, National Academy of Sciences -
National Research Council, Resources and Man, W.
H. Freeman and Company, San Francisco, 1969.
- Federal Energy Administration, Project Independence Report,
U. S. Government Printing Office, Washington,
November, 1974.
- Landsberg, Hans, "Low Cost, Abundant Energy: Paradise Lost?",
Science, April 19, 1974.
- Moore, J. Cordell, "Observations on United States Energy Policy,"
November 1, 1966.
- Policy Study Group of the M.I.T. Energy Laboratory, "Energy,
Self-Sufficiency: An Economic Evaluation," Technology
Review, May, 1974.
- Rose, David, "Energy Policy in the U. S.," Scientific American,
January, 1974.
- Tripartite Report, "Cooperative Approaches to World Energy
Problems", The Brookings Institution, Washington, DC,
1974.
- Wilson, Carroll L., "A Plan For Energy Independence," Foreign
Affairs, Vol. 51, No. 4, July, 1973.