ENERGY STATISTICS

656

HEARINGS

BEFORE THE

SUBCOMMITTEE ON PRIORITIES AND ECONOMY IN GOVERNMENT

OF THE

JOINT ECONOMIC COMMITTEE

CONGRESS OF THE UNITED STATES

NINETY-THIRD CONGRESS

FIRST AND SECOND SESSIONS

JANUARY 14 AND 21, 1974

Printed for the use of the Joint Economic Committee

ENERGY STATISTICS

HEARINGS

BEFORE THE

SUBCOMMITTEE ON PRIORITIES AND ECONOMY IN GOVERNMENT

OF THE

JOINT ECONOMIC COMMITTEE

CONGRESS OF THE UNITED STATES

NINETY-THIRD CONGRESS

FIRST AND SECOND SESSIONS

JANUARY 14 AND 21, 1974

Printed for the use of the Joint Economic Committee

U.S. GOVERNMENT PRINTING OFFICE

37-143 O WASHINGTON : 1974

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - Price $3.85
Stock Number 5270-02575

JOINT ECONOMIC COMMITTEE

(Created pursuant to sec. 5(a) of Public Law 304, 79th Cong.)

WRIGHT PATMAN, Texas, *Chairman*
WILLIAM PROXMIRE, Wisconsin, *Vice Chairman*

HOUSE OF REPRESENTATIVES	SENATE
RICHARD BOLLING, Missouri	JOHN SPARKMAN, Alabama
HENRY S. REUSS, Wisconsin	J. W. FULBRIGHT, Arkansas
MARTHA W. GRIFFITHS, Michigan	ABRAHAM RIBICOFF, Connecticut
WILLIAM S. MOORHEAD, Pennsylvania	HUBERT H. HUMPHREY, Minnesota
HUGH L. CAREY, New York	LLOYD M. BENTSEN, Jr., Texas
WILLIAM B. WIDNALL, New Jersey	JACOB K. JAVITS, New York
BARBER B. CONABLE, Jr., New York	CHARLES H. PERCY, Illinois
CLARENCE J. BROWN, Ohio	JAMES B. PEARSON, Kansas
BEN B. BLACKBURN, Georgia	RICHARD S. SCHWEIKER, Pennsylvania

JOHN R. STARK, *Executive Director*
LOUGHLIN F. MCHUGH, *Senior Economist*

ECONOMISTS

WILLIAM A. COX — LUCY A. FALCONE — SARAH JACKSON
JERRY J. JASINOWSKI — JOHN R. KARLIK — RICHARD F. KAUFMAN
L. DOUGLAS LEE — COURTENAY M. SLATER

MINORITY

LESLIE J. BANDER — GEORGE D. KRUMBHAAR, Jr. (Counsel) — WALTER B. LAESSIG (Counsel)

SUBCOMMITTEE ON PRIORITIES AND ECONOMY IN GOVERNMENT

WILLIAM PROXMIRE, Wisconsin, *Chairman*

SENATE	HOUSE OF REPRESENTATIVES
JOHN SPARKMAN, Alabama	WRIGHT PATMAN, Texas
J. W. FULBRIGHT, Arkansas	MARTHA W. GRIFFITHS, Michigan
HUBERT H. HUMPHREY, Minnesota	WILLIAM S. MOORHEAD, Pennsylvania
CHARLES H. PERCY, Illinois	HUGH L. CAREY, New York
JAMES B. PEARSON, Kansas	BARBER B. CONABLE, Jr., New York
RICHARD S. SCHWEIKER, Pennsylvania	CLARENCE J. BROWN, Ohio
	BEN B. BLACKBURN, Georgia

CONTENTS

WITNESSES AND STATEMENTS

MONDAY, JANUARY 14, 1974

Page

Proxmire, Hon. William, chairman of the Subcommittee on Priorities and Economy in Government: Opening statement 1

Simon, Hon. William E., Deputy Secretary of the Treasury and Administrator, Federal Energy Office, accompanied by John Sawhill, Deputy Administrator; William Walker, General Counsel; Gerald Parsky, Executive Assistant; Eric Zausner, Assistant Administrator for Data Analysis; and Charles Owens, Price Regulation 4

Nader, Ralph, consumer advocate 121

AFTERNOON SESSION

Freeman, David, Ford Foundation energy policy project 184

Darmstadter, Joel, Resources for the Future 186

Allvine, Fred, energy consultant 188

MONDAY, JANUARY 21, 1974

Proxmire, Hon. William, chairman of the Subcommittee on Priorities and Economy in Government: Opening statement 209

Nelson, Hon. Gaylord, a U.S. Senator from the State of Wisconsin, accompanied by Raymond D. Watts, counsel, Select Committee on Small Business 210

Rigg, Hon. John B., Deputy Assistant Secretary, Department of the Interior, accompanied by V. E. McKelvey, Director, U.S. Geological Survey; John D. Morgan, Jr., Acting Director, Bureau of Mines; Bill Elliott, Division of Fossil Fuels, Bureau of Mines; and Robert Rioux, Conservation Division, U.S. Geological Survey 236

Shiskin, Hon. Julius, Commissioner, Bureau of Labor Statistics, Department of Labor, accompanied by Janet Norwood, Deputy Commissioner for Data Analysis; and Margaret Stotz, Chief, Wholesale Price Division 245

Hodges, John E., director of statistics, American Petroleum Institute 253

SUBMISSIONS FOR THE RECORD

MONDAY, JANUARY 14, 1974

Carey, Hon. Hugh L.:

Report on—

"Mandatory Oil Import Control Program, Its Impact on the Domestic Minerals Industry and National Security," together with dissenting and separate views, Committee on Interior and Insular Affairs, House of Representatives, committee print No. 11, 90th Congress, second session, dated August 1968 11

"The Oil Import Question," together with dissenting and separate views, Subcommittee on Mines and Mining, Committee on Interior and Insular Affairs, House of Representatives, committee print No. 1, 91st Congress, second session, dated August 1970 52

Page

Nader, Ralph:
Report entitled "Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada and United States Productive Capacity as of December 31, 1972," extract of pages 4–25, 82, and 83, by the American Petroleum Institute, dated May 1973 ---- 131
Study entitled "Analysis of Salient Issues Regarding the Estimation of Proved Oil and Gas Reserve Figures," extract of pages II, 5–57, 71, 72, and 76–80, by Energy Research, Inc., dated November 13, 1973 ---- 146
Article entitled "Too Much Energy," from the Economist of London, reprinted in the Washington Star-News, January 13, 1974 ---- 177
Simon, Hon. William E., et al.:
Response to Chairman Proxmire's request to document for the record exactly how the Federal Energy Office is going to be able to confirm the justification for the price increases beyond the present $5.25 a barrel for oil ---- 107

AFTERNOON SESSION

Darmstadter, Joel:
Response to Chairman Proxmire's request to comment, for the record, upon Mr. Simon's testimony before the subcommittee ---- 205

MONDAY, JANUARY 21, 1974

Hodges, John E.:
Prepared statement with exhibits ---- 256
Nelson, Hon. Gaylord, et al.:
Editorials:
"Knowledge and Power," from the New York Times, January 17, 1974 ---- 214
"Getting the Energy Facts," from the Washington Star-News, January 17, 1974 ---- 214
Statement on S. 2782, a bill to establish a National Energy Information System, at the time of its introduction by Senator Nelson (for himself and Senator Jackson), from the Congressional Record, December 6, 1973, pages S22002–22014 ---- 215
Article entitled "North Sea Oil: More Than We Know," by Bernard D. Nossiter, from the Washington Post, December 2, 1973 ---- 224
Response to additional written questions posed by Chairman Proxmire ---- 234
Rigg, Hon. John B., et al.:
Prepared statement ---- 239
Response to Chairman Proxmire's request to check on how many days of gasoline supply the United States has in gasoline stocks ---- 318
Response to Chairman Proxmire's request to supply for the record what energy data collection and analysis funds were requested that were denied by the Department of Interior or OMB before the budget went to Congress ---- 342
Response to Chairman Proxmire's request to supply for the record what competence is needed and what funding is required to meet the Federal Government's energy resource factfinding and analytic capability ---- 343
Response to Chairman Proxmire's request to supply for the record the report entitled "Mining and Minerals Policy, 1973," second annual report of the Secretary of the Interior under the Mining and Minerals Policy Act of 1970, dated June 1973 ---- 345
Response to Chairman Proxmire's request to supply for the record the present approach and procedure used by the Department of the Interior in requring, presenting, and assessing geological and geophysical data on the extent and quality of offshore resources and reserves in undeveloped areas ---- 432

Rigg, Hon. John B., et al.—Continued Page
Reponse to Chairman Proxmire's request to supply for the record the necessary ingredients to conduct a study to provide for a government exploratory system that would independently acquire and process geophysical data on the Outer Continental Shelf to the extent necessary to bring the Government to a position equivalent to that of private industry 438
Response to Chairman Proxmire's request to supply for the record the figures on coal leases on Federal lands 441
Response to Chairman Proxmire's question regarding the Federal Government having a capability equivalent to private industry for determining the extent of coal resources and reserves in the public domain 444
Shiskin, Hon. Julius, et al.:
Prepared statement 248
Response in the context of the colloquy and interrogation by Chairman Proxmire regarding mandatory reporting 428
Response to Chairman Proxmire's question of how many full-time or part-time people does the BLS have working on the petroleum price index 429

ENERGY STATISTICS

MONDAY, JANUARY 14, 1974

CONGRESS OF THE UNITED STATES,
SUBCOMMITTEE ON PRIORITIES AND
ECONOMY IN GOVERNMENT OF THE
JOINT ECONOMIC COMMITTEE,
Washington, D.C.

The subcommittee met, pursuant to notice, at 10:30 a.m., in room 1202, Dirksen Senate Office Building, Hon. William Proxmire (chairman of the subcommittee) presiding.

Present: Senators Proxmire and Javits; and Representatives Carey and Conable.

Also present: Loughlin F. McHugh, senior economist; William A. Cox, Lucy A. Falcone, Sarah Jackson, Jerry J. Jasinowski, John R. Karlik, Richard F. Kaufman, L. Douglas Lee, and Courtenay M. Slater, professional staff members; Michael J. Runde, administrative assistant; Leslie J. Bander, minority economist; George D. Krumbhaar, Jr., minority counsel; and Walter B. Laessig, minority counsel.

OPENING STATEMENT OF CHAIRMAN PROXMIRE

Chairman PROXMIRE. The subcommittee will come to order. Mr. Simon, there is a great skepticism in the country. A shockingly large proportion of people, perhaps most of our people, doubt the existence of the energy crisis. They believe it is a Government-oil industry-sponsored put-on to raise prices and increase profits at the expense of consumers. Others say the oil shortage is real but it is being manipulated by the oil industry and Government to increase oil industry profits and the shifts and changes from day-to-day in statements from the Government adds to the turmoil.

The first objective of these hearings, therefore, is to establish the facts and to get from those who make public policy the basis for their facts, the question of who provides them, how reliable they are, and what means the Government and the public have of verifying their accuracy.

When I say that there is considerable question, I am sure you have been swamped by mail, too, but this is just typical of one Senator's office. We have had 3,843 letters in the last 3 weeks on the energy shortage and I am sure Senator Javits, coming from a bigger State, has had even more than that.

Senator JAVITS. I would say we have nearer 20,000, 25,000.

Chairman PROXMIRE. We want the facts on production, reserves, inventories, and consumption. We want the facts for both the immediate short-run problems and about the long-run issues. And we want the facts not only about supply and production but we want them about costs and prices. The full audit that you have pledged of refineries may give us some of the answers, I suspect not all the answers, and perhaps only a small part of it. Furthermore, at the present time, there seems to be little or no concern on the part of the Government itself as ot whether or not the huge, unprecedented, and inflationary rise in fuel costs are related in any direct way to costs.

The immense increase in oil industry profits past and prospective makes a devastating prima facie case that these huge price increases are not cost justified.

What effect does the rise in the price of fuel and gasoline have on inflation in this country? We are told that we must reduce fuel consumption by about 20 percent. Presently the basic public policy, in addition to minor conservation efforts, appears to be to allow the price to rise sufficiently to reduce consumption by that amount. But many economists tell us that to achieve that goal through the price mechanism alone, the price of gasoline will have to go up by 100 percent.

What effect will that kind of increase have on inflation? And how many jobs are at stake? How high will unemployment go? How much additional Government spending will be required to pay for the increase in unemployment benefits, the rise in welfare costs?

There is public outrage about this crisis. The average American family has been paying through the nose, first for inflation, second for massive increases in food prices, and now for skyrocketing increases for the gas to drive their cars and the fuel to heat their home. While the actual real income of the American weekly wage earner dropped this last year, oil company profits rose by 63 percent, according to the Business Week survey.

The outrage at what has happened has led some people to call for the nationalization of the oil industry. Others call for putting the industry under public utility regulation. Personally, I do not believe that either step would be wise public policy.

But the oil and gas industry and those in the executive branch of the Government should realize that the least we can expect from the energy industry are the facts. There must be full disclosure. This is not a private matter. This is a national crisis.

Men and women are losing their jobs. Prices are going up at a fantastic rate. In these circumstances there is no way the American people are going to stand for a vital industry telling them that the basic facts are proprietary or secret information while they are paying through the nose for the consequences.

Today our first witness is the head of the Federal Energy Office, the man who has been called the Energy Czar of the country. The people of the country have been impressed with Mr. Simon's vigor, his willingness, unique at this time, to talk to the press and the American people, and his obvious intelligence and ability. I think all of us should also be aware—I have said this in a previous committee, meeting, but I want to say it again, that I do not think anybody who has come to Government in recent years has made the kind

of sacrifice that Mr. Simon has made. He is a man who gave up an enormously remumerative job to take this service and do this tremendous amount of work under great pressure. I think all of us owe him a great deal of thanks for what he is doing for his country.

You are asking many of the same questions, not all but many of the questions I have raised. Mr. Simon, we welcome you here.

Congressman Conable.

Representative CONABLE. Thank you, Mr. Chairman. I would like to say a word.

Mr. Simon, I would like to echo what the chairman has said about your services personally. I think many of us are most grateful for your willingness to take on this very difficult responsibility under extremely difficult circumstances. I am sure you are having to absorb a great deal of data and in fact generate a great deal of data in a very short time because of the pressure of public concern on this issue.

Those of us who know you have considerable confidence in your ability to handle the job and we are grateful that you are willing to do it.

Chairman PROXMIRE. Senator Javits.

Senator JAVITS. Mr. Chairman, I just wish to announce that I am here this morning because, one, I would like to associate myself with everything said by the chairman and the ranking member, Mr. Conable, about the issue and about the Administrator himself.

Secondly, I am here because my State and my own home city, New York City, seem to be suffering unduly in this crisis, especially noting the fact that the New York City region, with almost 10 percent of the population, consumes less energy than any comparable area in the United States for the various reasons, including mass transit, et cetera.

Under those circumstances, it seems especially hard on our people that they seem to be suffering the most in terms of gasoline lines, shortages, and extremely high prices for what they do get. I have notified Mr. Simon in advance that I shall be asking these questions as to why New York is taking it on the chin so heavily in this matter and what is to be done about it.

I wish to add at once that Oregon and Arizona are currently in the same position but with very much smaller populations and very much less pressure on them because of weather. Of the three, ours is the most severe problem.

Mr. Chairman, I also would like to state that I think it is most constructive that the Chair has called these hearings at this time notwithstanding the recess because I think that many uncoordinated efforts are going forward, and it is essential that the facts be gathered into a coordinated pattern and I believe that in the process of legislative oversight, we can both ride hard on those who are taking advantage of the emergency, and we can also help the Administrator to have a coordinated picture in terms of State activity and private activity which is the ultimate desire as far as we are concerned.

Thank you, Mr. Chairman.

Chairman PROXMIRE. Mr. Simon, please proceed.

STATEMENT OF HON. WILLIAM E. SIMON, DEPUTY SECRETARY OF THE TREASURY AND ADMINISTRATOR, FEDERAL ENERGY OFFICE, ACCOMPANIED BY JOHN SAWHILL, DEPUTY ADMINISTRATOR; WILLIAM WALKER, GENERAL COUNSEL; GERALD PARSKY, EXECUTIVE ASSISTANT; ERIC ZAUSNER, ASSISTANT ADMINISTRATOR FOR DATA ANALYSIS; AND CHARLES OWENS, PRICE REGULATION

Mr. SIMON. Thank you, Mr. Chairman. I note your kind remarks. I would like to echo what Senator Javits just said. I think the important thing that we can do—I congratulate you, Mr. Chairman, for calling these hearings because no one wants to get the facts before the American people about this energy problem more than I. I understand the great problem of credibility in the institution of Government today. This is a very complex subject and one which through dialog generated through these hearings, as the facts begin to surface, many of the misstatements, wrong impressions that people have, will be placed before the people in an orderly fashion and I look forward to participating in this dialog and will spend whatever time it takes, and my associates will do the same, to make sure that we attempt to get these facts before the people.

There is a tremendous misimpression that we are attempting to manage this shortage through the price mechanism when indeed, we really have very little control over the prices of imports which have skyrocketed, close to 400 percent in the past year. I will deal with that during the question and answer period, I am sure, in an attempt to deal with the specifics of the components of this industry and our petroleum consumption in this country and how the price of a gallon of gasoline, if you will, relates to the amount of oil that we bring in from abroad.

I would like to thank you for the opportunity to appear before you today to discuss our energy data requirements. The Arab embargo will reduce our petroleum supplies almost 14 percent below expected demand. Some have questioned the accuracy of these estimates. I welcome the opportunity to address the credibility of our estimates, the sources of the data which we use in making them, and our plans to improve our energy information capabilities.

While many doubt the accuracy of the data being provided by industry, there is no doubt in my mind that we do indeed have a serious shortage. Consumption this year is expected to be significantly above last year—a continuation of historic trends. Domestic production, on the other hand, has leveled off and commenced to decline. The result has been ever-increasing levels of imports and a growing dependence on Arab crude oil and products refined in third countries from Middle East oil. In October, a 100 percent U.S. embargo was announced and while the estimated impact varies depending on assumptions, the existence of a shortage simply cannot be denied.

In developing our estimates of the embargo, a worst but still realistic situation was used. Responsible national energy policy can

only be developed by planning for the worst. I would like to be surprised by more favorable events, but we cannot afford to have programs developed which are not adequate as the situation progresses.

To a certain extent, the plain logic of a shortage has been confused by seemingly contradictory facts—primarily our very favorable inventory position at yearend. However, this is due to unusually warm weather through the winter to date, the effect of conservation by the American people, and leakage of the Arab embargo. The result has been increased inventories. There is also one more important factor. We must remember that as Chairman of the Oil Policy Committee, in early and late winter we changed the mandatory oil import program and its effect was to create massive new numbers of importers in this country, new storage facilities that have never been reported in this country, and all of this has created greater inventories than normal.

As of December 20, the American Petroleum Institute reported we have only slightly over 30 days' supply of the major petroleum products. The shortage caused by a fully effective embargo will quickly reduce these to dangerously low levels unless we act quickly to reduce demand and equitably allocate the available supplies.

A comprehensive domestic and international data system is clearly needed and the FEO is now analyzing the best ways to structure and implement such a system. Such a system is of little use now in this time of petroleum shortage and, therefore, I would prefer to focus on our most crucial information needs now and how we intend to meet them.

CURRENT INFORMATION SOURCES

Let me say right at the outset that there has never been in existence an adequate energy data system. One was never needed or really ever desired until recently. Today and in the years ahead we need better data on everything from reserves to refinery operations to inventories. Nevertheless, we are in an emergency situation and we cannot wait for new systems before making many of the decisions which have to be made. We must and are using and modifying the systems we now have until new and better ones can be developed. Almost without exception I feel we need more accurate, timely, and comprehensive data, data that we can check, verify, and cross-check. We intend to get such data, but must rely on the existing data at least for the next several weeks.

Our current data system includes production of crude oil and closely related products, imports of both crude oil and refined products, refinery operations, and shipments of petroleum products by refineries. It also encompasses the transportation systems linking the oil fields, the refineries, and the bulk terminals. Finally, petroleum stocks or inventories held by terminal operators, refiners, and pipeline companies are also reported.

Data on the domestic petroleum supply system are gathered by the Bureau of Mines—BOM—and by the American Petroleum In-

stitute—API. The Bureau of Mines data are gathered primarily through a monthly report by refining companies, supplemented by monthly data gathered from terminal operators. Additional information on crude oil production is obtained from State agencies, and additional information on imports, primarily imports of refined products, is obtained through Census Bureau reports based on information gathered by the Bureau of Customs. The Bureau of Mines reporting system is voluntary, but there is a very high degree of cooperation by the petroleum companies, and the response rate is in fact higher than that achieved in many supposedly mandatory information reporting systems.

The API has a much less detailed reporting system than the Bureau of Mines, but it receives and publishes data on a weekly basis. For example, API collects refinery information from about 60 percent of the refiners which account for over 90 percent of domestic operations. These data include refinery crude runs, production and yields of all major refined products, and inventories of crude oils and finished products. Detailed information on imports are also compiled by the API.

We have already completed preliminary cross-checks of these reporting systems and have found them to be reasonably accurate and quite consistent over long periods of time, although on a week-to-week or month-to-month basis differences of up to several hundred thousand barrels per day can and indeed do occur. For example, during the first 10 months of 1973 API reports differed from the data published by the Bureau of Mines by less than one-half of 1 percent.

While these cross-checks indicate that the data appear sufficiently accurate for management decisions, there are still significant deficiencies in these systems. Let me briefly summarize the problems.

First, industry coverage by the API for the weekly statistics is not complete. Smaller refiners and importers are not included and the statistical techniques used to extrapolate the sample to industry totals may not be completely adequate in these times of shortage and rapid change.

The second major problem deals with secondary stocks—those petroleum inventories not held by refineries and major terminal operators—and consumption. Particularly in times of shortage, information on all inventories and actual use rates are important, but our reporting systems are just inadequate. Information on reserves is also inadequate. While not critical in dealing with the embargo, accurate reserve data is needed if we are to develop sound public policy.

In contrast to the primary supply ssytem, where both the Bureau of Mines and the API provide comprehensive although not completely adequate data, information about secondary stocks and consumption can be obtained only by considering a number of sources, but even the combination of all these data sources does not provide complete information. However, selected data are available. The

Federal Power Commission compiles data on the use of all fuels, including petroleum, for the generation of electricity.

The Civil Aeronautics Board collects data on the use of aviation fuels by certified carriers. The Bureau of Census collects data on fuels and electric energy consumed in manufacturing industries once every five years of manufacture, and estimates are provided in intervening years. From all of these data sources one can build only an incomplete picture.

There are two additional deficiencies in most of our current energy data: Lack of regional and seasonal differences in consumption. To make our allocation programs work properly, we must know where and when the different petroleum products are needed. Current needs must be determined in large part by reference to past consumption levels and trends, but data on past consumption patterns are not available by States and by month. Further breakdowns of consumption by industry or other users are not available. These kinds of data are not available primarily because they were never before needed for operation of programs typically within range of U.S. Government policies. But they are needed now.

Our final point must be made. All of our current sources of data are voluntary and for many of the programs we now must operate this is simply not enough. We now clearly need mandatory reporting systems and mechanisms to check and enforce their proper operation.

NEW REPORTING SYSTEMS

We have already instituted a number of new systems to collect better energy data data and to improve our management capabilities.

We have instituted immediate daily reporting of tanker arrivals by the Bureau of Customs, so that petroleum imports data can be available and processed with a lag of only about 1 week instead of the month or two required for complete Census Bureau processing of all Customs imports data, including petroleum. This will provide a further check on imports as presently reported by the API.

The Navy has agreed to provide a forecast, using its worldwide capability for tracking ocean shipping, of tanker arrivals in the United States for up to 4 weeks in the future.

We are establishing a system for obtaining, on a sample basis, measures of actual consumption of home heating oil, adjusted for the weather. Data have been coming from New England for a month, through the cooperation of the New England Fuels Institute, its member dealers, and their computer service bureaus. Broader coverage will be achieved as additional companies or associations are brought into this program.

We have been working with the FPC to establish a rapid reporting and forecasting system for the consumption and stocks of all fuels, including petroleum, used to generate electricity.

I will be visiting the Texas Railroad Commission shortly and also other State regulatory agencies to see what can be done to get

more accurate and timely information on reserves, capped wells, and maximum recovery rates.

These systems represent just a start in the overall mandatory reporting systems we are now developing. Most important, perhaps, is an integrated mandatory reporting system for petroleum products. I have directed that such a system be developed and implemented for all refiners. It has three essential parts. First, reports of expected refinery operations during the coming quarter and reports of expected inventories and shipments to each State for the coming months will be required. This information will provide the backbone for planning and operating our allocation programs.

Second, we are now developing a weekly reporting system for all refiners, major bulk terminal operators and pipeline companies to give FEO production, yields, and stocks information directly from industry. This system will obviate our need to rely on API aggregated data.

Finally, monthly reports, certified by company officials of refiners, pipeline companies and bulk terminal operators will be required. FEO audit teams, assisted by the IRS, will make continuous field checks of the information contained in these forms. We expect that every major refiner will be audited at least partially four times each year.

The forms, computer systems and implementing regulations are now being developed and the complete system will be operational in about 6 weeks. This system will provide the detailed, verifiable information we must have to operate. The system will be further expanded to include secondary stocks as soon as possible.

I am advised that we have sufficient legal authority under both the Economic Stabilization Act and the Emergency Petroleum Allocation Act to require these reports be filed and enforce legal sanctions if they are not.

None of these systems will provide all of the information we need during this present crisis. There will continue to be important facts or questions that only targeted spot checks can confirm. Reports of price gouging, hoarding or the possibilities of ships offshore awaiting higher prices are all certainly cases in point. We have already dealt with problems like this. We used over 1,000 IRS agents late last year to sweep the 48 States looking for price gouging. The Coast Guard used its District Commanders and major port personnel to make physical checks on unusual tanker activities. Let me assure this committee that we intend to maintain sufficient flexibility and manpower resources to continue these activities as needed to cope with this shortage.

NEW LEGISLATION ON ENERGY REPORTING

While I feel we have sufficient authority to mandate the petroleum data we now need, I still feel that specific mandatory reporting legislation is required. First, tailored sanctions and enforcement provisions may be more appropriate than those in our current

authorities. Second, expansion of mandatory reporting to other energy sources, such as coal and uranium, is a necessity in the months ahead and may not be practical under our existing authorities.

We are now developing the information needed to propose specific mandatory reporting legislation. Such legislation will go beyond information on petroleum inventories, imports and refinery operations. The more complex problem of reserves and nonpetroleum products will be included.

PUBLIC DISCLOSURE

A central issue, and one which I personally consider important, is the extent to which the information which is reported to us ought to be made available to others. I personally feel that the public has a right to complete and accurate information on the energy situation.

This policy should give way only where limitations are imposed by statute and where important public policy considerations dictate otherwise.

For example, there will undoubtedly be national security constraints upon the release of certain information about military fuel supply levels. Further, competitive considerations will dictate confidentiality in cases where disclosure of future production or shipment plans could be used for anticompetitive or predatory purposes. We will be conferring with the Justice Department and Federal Trade Commission on the antitrust risks involved in disclosure, on a company-by-company basis, of certain sensitive commercial information. But I would expect these limitations to be relatively narrow and that most of the information would be more widely available. Certainly, I am persuaded that both the Government and the public are entitled to much more information about the petroleum industry than is now available. We intend to see that it is gathered and made available. To this end, we will be presenting proposals recognizing three categories of information disclosure. The first will be that information generally available to the public; second is that information which should be available only to other Government bodies with a legitimate interest in and need for the material; and, third, that information which ought properly to be limited to FEO in the carrying out of its responsibilities. I believe these proposals will mitigate concerns about excessive confidentiality, and will greatly broaden public acceptance of the information which the Government collects and publishes on this subject.

SUMMARY

Let me close by assuring this committee that the Federal Energy Office fully intends to get all the information needed to do our job and fairly present the facts to the American people. We have already made substantial progress in our energy data systems. Under the authorities we now have, we will implement mandatory report-

ing requirements for the petroleum industry. And, under authorities which we are now evaluating, and would hope to work closely with Congress in finally formulating, to develop the broad-based energy information systems needed not only to deal with our current problems but with the challenge in the decade ahead.

My associates, John Sawhill, my Deputy, and other senior members of the Federal Energy Office will be delighted to respond to any questions, Mr. Chairman.

Thank you.

Chairman PROXMIRE. Thank you, Mr. Simon.

Mr. Simon, I understand Congressman Carey has to leave. He has to catch an 11 o'clock plane but he would like to say a word before he goes.

Representative CAREY. Thank you, Mr. Chairman. I want to welcome my fellow New Yorker, Mr. Simon, here today and and commend him for the candid and devoted way in which he pursued this complex problem. I had said to him privately the other day even when we were calling on him for help in New York City I felt he had amassed the complexities of the problem so well and began to move toward decisive action, he might well jeopardize his future but I know he is prepared to take that risk.

I just want to state that your testimony is exactly on line with what I want to produce for the people in my responsible position. I had 15 years' experience in this industry. I know it is so computerized, so filled with data supply, that good will in the industry should have no trouble complying with whatever you exact from them or seek to exact from them in the way of information.

Just one personal observation. I do hope you will expand your proposal to also find out from the multinational oil companies the full extent of their deposits, developed reserves and potential reserves in overseas holdings. Unless we have that picture, we really do not have the full prospectus on where the oil may come from and keep in mind that all of those reserves, all of those Government holdings, were produced under American tax benefits with American tax incentives. I hope you will pursue that data as well. We cannot have the whole picture unless we get the overseas data which is in the possession of seven or eight major oil companies.

I must leave at 10:30 to catch a plane for New York City to attend a fuel emergency meeting.

I wish to submit for the record copies of committee print No. 11, 90th Congress, second session, Committee on Interior and Insular Affairs, dated August 1968, reflecting the dissenting views of myself and others calling for an end to the oil import program, and committee print No. 1, 91st Congress, second session, Subcommittee on Mines and Mining of the Committee on Interior and Insular Affairs, dated August 1970, with similar dissenting views.

Chairman PROXMIRE. Without objection, so ordered.

[The committee prints follow:]

90th Congress
2d Session

COMMITTEE PRINT NO. 11

REPORT

ON

MANDATORY OIL IMPORT CONTROL PROGRAM, ITS IMPACT ON THE DOMESTIC MINERALS INDUSTRY AND NATIONAL SECURITY

(TOGETHER WITH DISSENTING AND SEPARATE VIEWS)

COMMITTEE

ON

INTERIOR AND INSULAR AFFAIRS

OF THE

HOUSE OF REPRESENTATIVES

AUGUST 1968

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

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON : 1968

COMMITTEE ON INTERIOR AND INSULAR AFFAIRS

HOUSE OF REPRESENTATIVES

WAYNE N. ASPINALL, Colorado, *Chairman*

JAMES A. HALEY, Florida
ED EDMONDSON, Oklahoma
WALTER S. BARING, Nevada
ROY A. TAYLOR, North Carolina
HAROLD T. JOHNSON, California
HUGH L. CAREY, New York
MORRIS K. UDALL, Arizona
PHILLIP BURTON, California
JOHN V. TUNNEY, California
THOMAS S. FOLEY, Washington
RICHARD WHITE, Texas
ROBERT W. KASTENMEIER, Wisconsin
JAMES G. O'HARA, Michigan
WILLIAM F. RYAN, New York
PATSY T. MINK, Hawaii
JAMES KEE, West Virginia
LLOYD MEEDS, Washington
ABRAHAM KAZEN, JR., Texas

SANTIAGO POLANCO-ABREU,
Resident Commissioner, Puerto Rico

JOHN P. SAYLOR, Pennsylvania,
Ranking Minority Member
E. Y. BERRY, South Dakota
CRAIG HOSMER, California
JOE SKUBITZ, Kansas
LAURENCE J. BURTON, Utah
ROGERS C. B. MORTON, Maryland
WENDELL WYATT, Oregon
GEORGE V. HANSEN, Idaho
ED REINECKE, California
THEODORE R. KUPFERMAN, New York
JOHN KYL, Iowa
SAM STEIGER, Arizona
HOWARD W. POLLOCK, Alaska
JAMES A. McCLURE, Idaho

SIDNEY L. MCFARLAND, *Professional Staff Director*
T. RICHARD WITMER, *Counsel*

MINES AND MINING

ED EDMONDSON, *Chairman*

WALTER S. BARING
HUGH L. CAREY
PHILLIP BURTON
THOMAS S. FOLEY
JAMES G. O'HARA
JAMES KEE
ABRAHAM KAZEN, JR.

LAURENCE J. BURTON
E. Y. BERRY
CRAIG HOSMER
JOE SKUBITZ
ED REINECKE
JAMES A. McCLURE

WILLIAM L. SHAFER, *Consultant on Mining and Minerals*

NOTE.—The chairman, Hon. Wayne N. Aspinall, and the ranking minority member, Hon. John P. Saylor, are ex officio members of each subcommittee.

MANDATORY OIL IMPORT PROGRAM

Introduction

The Subcommittee on Mines and Mining of the House Committee on Interior and Insular Affairs held extensive hearings on the mandatory oil import program, as that program relates to the domestic petroleum industry, on May 13, 14, and 16, 1968. Represented at the hearings were all major segments of the petroleum industry, including both independent and major operators and producers, refiners, the coal industry, research groups, consumer and user groups and organizations, the petrochemical industry, Members of Congress, and representatives from States and territories, including the State of Hawaii, the Commonwealth of Puerto Rico, and the Virgin Islands. The Department of the Interior, as the administrator of the program, also testified.

The hearings were intended to provide a forum by which the Government's mandatory oil import program and the policies which guide its administration could be reviewed and clarified.

As a result of recent developments in the administration of the mandatory oil import program, and the deep concern expressed to the subcommittee by almost all segments of the domestic petroleum industry, it is the feeling of the subcommittee that there is an urgent need for a review of the policies, regulations, procedures and the day-to-day operations of this program.

When the mandatory oil import program was initiated in 1959 and shortly thereafter, there was no doubt about the program's major purpose, to insure the national security of this Nation by safeguarding and maintaining a vigorous and healthy domestic petroleum industry. Three Presidents of this Nation, beginning with President Eisenhower and continuing with President Kennedy and President Johnson, together with innumerable special task forces, commissions, and study groups, as well as several congressional committees, have all been of one mind on the objective of the mandatory oil import program. Its one and only reason for being is to insure the national security of this Nation by reducing this country's dependence on foreign imports by assuring a strong and vigorous domestic petroleum industry. (The specific statutes that provide the basis for this program and which emphasize the national security aspect of the program are cited on pages 8 to 12 inclusive.)

Recently, however, and particularly since 1965, the mandatory oil import program has undergone considerable administrative changes. What was once a simple, straightforward program, based upon the need to maintain a strong domestic petroleum industry for national security reasons, has become a complex, administrative wilderness clouded by rules and procedures that few understand and which are

constantly undergoing change. Exceptions and deviations from long-established rules and procedures have become increasingly common. These departures from established policy include such matters as allocations for petrochemicals, allocations because of "tight" supply situations, allocations because of economic hardship, establishment of foreign trade zones, proposals for auctioning off or selling import allocations by competitive bidding, and increased import allocation as a reward or incentive to produce low-sulphur residual fuel oil. All of these actions and proposals, as well as others, were taken under a program which owes its very existence to safeguarding the U.S. national security by the preservation of the domestic petroleum industry.

If a meaningful program is to be continued, it is imperative that a clear and definite policy be established under which the domestic petroleum industry and all other interested parties are fully informed as to the future of the program. If national security is of paramount consideration, and this subcommittee firmly believes that it is, together with the preservation of the domestic petroleum industry, then no further exception should be granted. If, on the other hand, the program has outlived its usefulness or if considerations other than national security are to be given equal or greater weight, whether these be situations of hardship, price, or temporary shortage, then the new criteria should also be clearly spelled out and defined in order that all may follow the newly established policy.

Before proceeding further it appears appropriate to point out that the subcommittee is not unmindful of the role of the consumer and his desire to obtain products at the lowest possible price. This desire, while temporarily beneficial, is not, however, always consistent with national security nor with long-term benefits. Unquestionably, domestic consumers are utilizing an ever-increasing amount of petroleum products for transportation, fuel, heating, and other uses necessary to maintain a high standard of living. In the event of a national emergency, it is essential that there be adequate supplies at reasonable cost, both now and in the future. The lower cost of imported oil is highly attractive, but clearly an excessive reliance upon imports and a shortrun advantage may not be to this Nation's best long term benefit. Imports could be cut off in an emergency. One has but to look to last year's Middle East crisis for a recent example of the sudden unavailability of foreign oil supplies. If this Nation had been without adequate sources of petroleum, and an industry capable of quickly increasing domestic production, the situation could have been extremely critical for us and for our European neighbors. Additionally, this vulnerability could easily, and quite likely would result in a much higher cost or even to the complete unavailability of oil to consumers. It, therefore, appears that the best interests of domestic consumers, as well as the national security, can be best served by a reasonable balance between domestic and foreign supplies.

The interest of this subcommittee in the mandatory oil import program comes about as a result of the House Committee on Interior and Insular Affairs' overall responsibility for the stability and well-being of the domestic mining industry generally, of which petroleum, natural gas, coal, and other energy fuels, are a most important part. Consequently, to the extent that the mandatory oil import program has an impact upon the domestic petroleum and coal industries and

their ability to produce energy fuels in time of war or peace, the House Committee on Interior and Insular Affairs, and this subcommittee, have an interest in the policies, procedures, and operations of the program.

It appears appropriate to point out that the following report deals chiefly with the oil import problems as they relate to the domestic petroleum industry in districts I–IV. This is not to say that the committee is not aware of the very serious problems that exist in district V. However, this district, which consists of Alaska, Arizona, California, Hawaii, Nevada, Oregon, and Washington, has conditions and problems that are unique to this particular geographic area and are not generally found in the other four districts. These problems, notwithstanding the fact they are not covered as extensively in the report as those in districts I–IV are nevertheless significant and deserve careful consideration. The committee wishes to emphasize that consideration should be given to the problems and conditions unique to this district.

The committee also wishes to take this opportunity to indicate that it is fully aware of the many complex problems and the many varied interests confronting the administrators of the mandatory oil import program. While the following report is sometimes critical of many aspects of the program and its administration, the committee wishes to state that this criticism in no way reflects upon the integrity or ability of those associated with the administration of the program. In particular, the committee wishes to commend those individuals in the Department of the Interior associated with the program and to recognize fully the integrity and ability they have exercised in carrying out their difficult responsibilities.

Background Leading to the Establishment of the Mandatory Oil Import Program in 1959

Few major national policies have received more study and consideration over the past 19 years than has the matter of petroleum imports and their impact on the domestic petroleum-producing industry and national security.

During the initial years of this period there emerged, as a direct result of the thorough and exhaustive consideration by the legislative and executive branches of the Federal Government, a firm national policy on petroleum imports. In the interest of national security this policy calls for the maintenance of a proper balance between petroleum imports and domestic petroleum production in order to insure a dynamic and vigorous domestic petroleum-producing industry—an industry which at all times would be capable of producing the petroleum needed to successfully prosecute wars, stave off and deter war threats, help other friendly nations with their petroleum needs in time of crisis, and to supply at reasonable prices the petroleum products so necessary for an ever-expanding national economy.

This basic national policy on petroleum imports did not just happen. Rather it evolved as a result of careful consideration by all branches of the Federal Government with the cooperation and assistance of the petroleum industry.

As far back as January 13, 1949, the National Petroleum Council, established under the auspices of the Federal Government as the

official oil industry advisory body to the Federal Government, outlined a set of fundamental principles as essential to a national oil policy. These principles, which were formulated by the Council at the request of the Secretary of the Interior, were adopted unanimously by the Council.

The very first of these fundamental principles was as follows:

> * * * The national security and welfare require a healthy domestic oil industry.
>
> Continuing supply to meet our national oil needs depends primarily on availability from domestic sources. Due consideration should be given to the development of foreign oil resources, but the paramount objective should be to maintain conditions best suited to a healthy domestic industry which is essential to national security and welfare.

Earlier, during World War II, the Petroleum Industry War Council had recommended to the Government certain policies which were reflective of the oil industry's peacetime and wartime experience with oil imports. This oil industry council was created under the Petroleum Administration for War, to act as an advisory body to the Government on problems affecting the oil industry.

This industry Council was requested to submit to the Petroleum Administrator, for the use of the Government, a statement of suggested policies for the Federal Government and the industry.

At the conclusion of the war, and at the last session of this agency, on October 24, 1945, the following resolution was adopted by that Council:

> Whereas during the emergency just ended, in order to meet accelerated war requirements, this Nation found it necessary to import abnormal quantities of crude oil and refined products from foreign sources; and
>
> Whereas the future of the domestic petroleum industry in this country depends on the maintenance of sufficient reserves and the productivity of its many fields, thereby enabling the industry to meet all the requirements incident to an expanding domestic economy; and
>
> Whereas the continued importation of large quantities of crude oil and products at prices below the cost of production of this country would have a depressing effect on exploration, development and production in the domestic industry; now, therefore, be it
>
> *Resolved, by the Petroleum Industry War Council, assembled on this the 24th day of October, 1945, in Washington, D.C.,* That it does declare that in the public interest and that in the interest of maintaining national security it should be the policy of this Nation to so restrict amounts of imported oil so that such quantities will not disturb or depress the producing end of the domestic petroleum industry, and only such amounts of oil should be imported into this country as is absolutely necessary to augment our domestic production when it is produced under conditions consonant with good conservation practices.

Thus, it can be seen that at the end of World War II the Petroleum Industry War Council, as a national advisory body to the Petroleum

Administrator, concluded that petroleum imports should not be permitted to enter the country in amounts sufficient to weaken the domestic petroleum producing industry and thus threaten our Nation's security.

Soon after World War II Congress began to investigate and give extensive consideration to the status of the domestic petroleum industry and how imported foreign oil affected this industry.

On January 31, 1947, the Special Committee Investigating Petroleum Resources, set up by the Senate, in Senate Report No. 9, 79th Congress, concluded as follows:

> In the final analysis, the reserves within our own borders are more likely than not to constitute the citadel of our defense.
>
> It follows that nothing should be done to weaken the productive capacity of domestic reserves, and that every possible step should be taken both to increase these reserves and continuously to develop them to such a degree as would occasion no regret in the event of war.
>
> * * * * *
>
> This Nation now faces two alternatives:
>
> Either—
>
> 1. To await with hope the discovery of sufficient petroleum within our boundaries that the military requirements of the future will occasion no concern, and in the meantime to depend upon foreign oil and trust that war will not cut off our imports;
>
> Or—
>
> 2. To take steps to guarantee a domestic petroleum supply adequate for all eventualities by means of:
>
> (*a*) Incentives to promote the search for new deposits of petroleum within the boundaries of the United States and in the continental shelf; and
>
> (*b*) The continuation of the present program looking to the manufacture of synthetic liquid fuels to supplement our domestic crude supply.
>
> All the facts before us impel the choice of the second alternative.

In the 1950's Congress continued to concern itself with the domestic petroleum industry and the matter of imports of foreign oil.

In developing a national petroleum imports policy, Congress had the benefit of studies and conclusions of the executive branch, such as:

The conclusions of the Defense Production Administration, established as a result of the Korean conflict, in January 1953, stated the results of its studies regarding defense matters in a report entitled "Background for Defense, Expanding Our Industrial Might," as follows:

> The machines of peace and war run on petroleum. A program to expand American industry substantially and keep it operating at top capacity requires constantly increasing quantities for fuel, for lubricants, and for many chemicals made from petroleum—everything from toluene for TNT to wax for packagings. Greater industrial activity and peak

levels of employment demand more and more gasoline for airplanes, automobiles, trucks, tractors, and buses, and more diesel fuel for locomotives.

The defense program will by 1953 boost our petroleum needs to some 8,200,000 barrels a day as contrasted with 6,800,000 barrels a day used in 1950—a better than 20-percent increase.

If we are to meet the needs, we shall have to drill more wells each year than ever before in our history. We shall have to expand the refineries where crude oil is made into gasoline and fuel oil and the other finished petroleum products. We shall have to enlarge our transportation facilities to move the crude petroleum to the refineries and the finished products to consumers.

In May of 1953, the Secretary of the Interior McKay, in appearing before the House Ways and Means Committee, stated as follows:

I recognize the importance of domestic petroleum production to national defense and the contribution it makes to the national economy and that of the oil-producing States. I also realize that the petroleum industry is unique in that discovery and development of new reserves constitute a major and vital activity of the industry. Oil and gas produced must be replaced by a vigorous and progressive search for new reserves or the Nation's ability to produce petroleum would rapidly deteriorate.

I recognize how important it is that the strength of the domestic industry be maintained. To maintain this strength requires an economic climate that promotes the competition, progress, and technological development that has brought the industry to its present high degree of capability. The domestic industry today is undergoing a period of readjustment. The rate of growth in demand has leveled off after the rapid gains which followed the Korean outbreak. At the same time the expansion of supply has brought about a more normal reserve capacity. Demand is now dropping seasonally at the close of a warm winter. Domestic production has been reduced in recent months, and *there should be a corresponding cut in imports.* There is evidence that already the industry is effecting such adjustments. [Emphasis supplied.]

However, imports of oil did not decrease, as was hoped, but continued to increase. In view of this continuing increase the President became concerned and took action.

On July 30, 1954, the President established an Advisory Committee on Energy Supplies and Resources Policy. The Director of the Office of Defense Mobilization was designated as Chairman and the heads of the following agencies served as members: Departments of State, Treasury, Defense, Justice, the Interior, and Commerce and Labor.

The White House directive respecting the Committee's assignment included the following specific statements:

At the direction of the President the Committee will undertake a study to evaluate all factors pertaining to the continued development of energy supplies and resources fuels in the United States, with the aim of strengthening the

national defense, providing orderly industrial growth, and assuring supplies for our expanding national economy and for any future emergency.

The Committee will review factors affecting the requirements and supplies of the major sources of energy including: coal (anthracite, bituminous and lignite, as well as coke, coke tars, and synthetic liquid fuels); petroleum and natural gas.

Upon conclusion of its work the President's Advisory Committee on Energy Supplies and Resources Policy recommended:

CRUDE OIL IMPORTS AND RESIDUAL FUEL OIL IMPORTS

An expanding domestic oil industry, plus a healthy oil industry in friendly countries which help to supply the U.S. market, constitute basically important elements in the kind of industrial strength which contributes most to a strong national defense. Other energy industries, especially coal, must also maintain a level of operation which will make possible rapid expansion in output should that become necessary. In this complex picture both domestic production and imports have important parts to play; neither should be sacrificed to the other.

Since World War II importation of crude oil and residual fuel oil into the United States has increased substantially, with the result that today these oils supply a significant part of the U.S. market for fuels.

The Committee believes that if the imports of crude and residual oils should exceed significantly the respective proportions that these imports of oils bore to the production of domestic crude oil in 1954, the domestic fuels situation could be so impaired as to endanger the orderly industrial growth which assures the military and civilian supplies and reserves that are necessary to the national defense. There would be an inadequate incentive for exploration and the discovery of new sources of supply.

In view of the foregoing, the committee concludes that in the interest of national defense imports should be kept in the balance recommended above. It is highly desirable that this be done by voluntary, individual action of those who are importing or those who become importers of crude or residual oil. The committee believes that every effort should be made and will be made to avoid the necessity of governmental intervention.

The committee recommends, however, that if in the future the imports of crude oil and residual fuel oils exceed significantly the respective proportions that such imported oils bore to domestic production of crude oil in 1954, appropriate action should be taken.

The committee recommends further that the desirable proportionate relationships between imports and domestic production be reviewed from time to time in the light of industrial expansion and changing economic and national defense requirements.

This report was released on February 26, 1955. As a result of this study the oil importing companies were requested to voluntarily restrict imports of petroleum into the United States on an individual company basis in conformity with the report of the President's Advisory Committee on Energy Supplies and Resources Policy.

Meanwhile this whole matter of petroleum imports was being debated in Congress. As a result Congress wrote section 7 into the Trade Agreements Extension Act of 1955 (69 Stat. 162). This section, known as the national security amendment reads as follows:

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

In adopting the National Security Amendment, the Senate Finance Committee (Rept. 232, 84th Cong., first sess.) stated:

> (9) The committee had before it several proposals dealing with specific commodities, namely petroleum, fluorspar, lead, and zinc. In lieu of specific action on each of these the committee adopted an amendment which specifies that the Director of the Office of Defense Mobilization shall report to the President when he has reason to believe that imports of a commodity are entering the United States in such quantities as to threaten to impair the national security; that the President shall cause an immediate investigation to be made if he feels there is reason for such belief; and that the President, if he finds a threat to the national security exists, shall take whatever action is necessary to adjust imports to a level that will not threaten to impair the national security.
>
> The committee believes that this amendment will provide a means for assistance to the various national defense industries which would have been affected by the individual amendments presented.
>
> The White House issued on February 26, 1955, a report based on a study by the President's Advisory Committee on Energy Supplies and Resources Policy which indicates the importance of a strong domestic petroleum industry.

Congress has thus provided the necessary tools for the President to use in case the growing tide of petroleum imports did not subside.

Imports of petroleum had been increasing during the years 1949 to 1955 and continued to increase during 1955. As a consequence of the

increased level of imports during 1955 and the first half of 1956, as well as the projected increase in the level of imports scheduled for the last half of 1956, the Independent Petroleum Association of America (IPAA) filed a petition on August 7, 1956, requesting action under section 7, the National Security Amendment, of the Trade Agreements Extension Act of 1955 (69 Stat. 162).

Pursuant thereto, the Director of Defense Mobilization held public hearings beginning on October 22, 1956.

Early in December 1956, due to the changed conditions growing out of the Suez crisis, the Director of Defense Mobilization suspended action on the case.

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

The growing threat to the domestic petroleum industry as cited by congressional, industrial, and administrative studies, as well as the ODM certification, led to the establishment by the President of the United States on June 26, 1957, of a Special Cabinet Committee to Investigate Crude Oil Imports. This committee was made up of: Sinclair Weeks, Secretary of Commerce, Chairman; John Foster Dulles, Secretary of State; Donald A. Quarles, for Secretary of Defense; George M. Humphrey, Secretary of the Treasury; Fred A. Seaton, Secretary of the Interior, and James Mitchell, Secretary of Labor.

The report of this Special Cabinet Committee To Investigate Crude Oil Imports, in part states:

> In summary, unless a reasonable limitation of petroleum imports is brought about, your committee believes that:
>
> (*a*) Oil imports will flow into this country in ever-mounting quantities, entirely disproportionate to the quantities needed to supplement domestic supply.
>
> (*b*) There will be a resultant discouragement of, and decrease in, domestic production.
>
> (*c*) There will be a marked decline in domestic exploration and development.
>
> (*d*) In the event of a serious emergency, this Nation will find itself years away from attaining the level of petroleum production necessary to meet our national security needs.
>
> * * * * *
>
> Your committee [the Special Cabinet Committee to Investigate Crude Oil Imports] recognizes that there are important foreign policy aspects to the problem of limiting petroleum imports. The oil reserves and production capacities of other free nations, as well as our own, are important to our national security. A number of countries inevitably depend in varying degree upon access to our domestic market for their petroleum exports and it must be recognized that it is also in the interest of our national security that our allies and friends have healthy and expanding economies. It is

believed, however, that taking all factors into consideration, our national security requires the maintenance of some reasonable balance between imports and domestic production at this time. In light of the foregoing considerations, our recommendations are framed with the objective of limiting imports in order to maintain such a balance and yet to allow other nations to participate in the growth of our domestic demand to a degree consistent with our national security.

It is our conviction that as a Nation we must pursue a careful, considered course that will permit reasonable imports into our country and still stimulate a dynamic and vigorous exploratory and development effort in this country.

This Special Cabinet Committee submitted its report to the President; and on July 29, 1957, President Eisenhower, in a memorandum for the Secretary of the Interior and the Director of the Office of Defense Mobilization, declared:

> I have approved the recommendations of the "Special Committee To Investigate Crude Oil Imports" as set forth in the attached report. I direct you to put these recommendations into effect as rapidly as possible.

Presidential approval of the Special Cabinet Committee's report thus established what became known as the "Voluntary Oil Import Program." This program was put into effect on July 1, 1957.

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

The mandatory program was established after the Director of the Office of Civil and Defense Mobilization on February 27, 1959, "advised the President that imports of crude oil and its products and derivatives were threatening to impair the national security."

On February 27, 1959, the Director of the Office of Civil and Defense Mobilization, in his memorandum for the President, quoted the Secretary of Commerce as follows:

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

In the same report, the Director said:

> The consequences would continue to upset a reasonable balance between imports and domestic *production*, with deleterious effect upon *adequate exploration* and the *development* of *additional* reserves which can only be generated by a healthy domestic *production* industry. [Emphasis added.]

Thus, the President issued Proclamation No. 3279, dated March 10, 1959, which placed in effect the mandatory oil import program to be administered by the Department of the Interior.

When he established the mandatory oil import program, the President issued the following statement:

> I have today issued a proclamation adjusting and regulating imports of crude oil and its principal products into the United States.
>
> * * * * * *
>
> The new program is designed to insure a stable, healthy industry in the United States capable of exploring for and developing new hemisphere reserves to replace those being depleted. The basis of the new program, like that for the voluntary program, is the certified requirements of our national security which make it necessary that we preserve to the greatest extent possible a vigorous, healthy petroleum industry in the United States.

The Program Since 1959

The mandatory oil import program was established by Presidential Proclamation No. 3279, issued March 10, 1959, under authority of section 2 of the Trade Agreements Act of July 1, 1954 as amended (72 Stat. 678). The proclamation, as amended, has been continued under authority of section 232 of the Trade Expansion Act of 1962 (76 Stat. 877).

The overriding significance of national security is clearly brought out in House Report 1761 of the Committee on Ways and Means in reporting on H.R. 12591, 85th Congress, which was subsequently enacted as the Trade Agreements Extension Act of 1958 (72 Stat. 678). The following comments are contained in that report:

THE NATIONAL SECURITY AMENDMENT

> Section 2 of the 1954 Extension Act provided that no trade agreement reduction in duty shall be made if it would threaten domestic production needed for projected national defense requirements. Section 7 of the Trade Agreements Extension Act of 1955 amended this section by adding a new subsection providing a procedure for investigation and action by the President if he agrees with the Director of the Office of Defense Mobilization that any article is being imported in such quantities as to threaten to impair the national security. The 1955 amendment provided that, if the President found such to be the case, he take such action as he deems necessary to adjust imports to a level that would not threaten to impair the national security.
>
> These provisions were the subject of voluminous testimony to the committee and of extended committee consideration. Most of the witnesses who addressed themselves to section 7 of the 1955 act were of the opinion that the provision should be amended in such a way as to speed up investigations and determinations under the section, and to clarify and make more specific the standards applicable to its administration. The committee has carefully considered the points of view expressed and has concluded that any question as to the adequacy of section 7 is resolved by the amendments to that section which the committee has made.

Your committee [the Committee on Ways and Means] was guided by the view that the national security amendment is not an alternative to the means afforded by the escape clause for providing industries which believe themselves injured, a second court in which to seek relief. Its purpose is a different one—to provide those best able to judge national security needs, namely, the President and the Director of the Office of Defense Mobilization, acting with the advice of such Cabinet officers as the Secretaries of Defense, Commerce, and State, a way of taking whatever action is needed to avoid a threat to the national security through imports. Serious injury to a particular industry, which is the principal consideration in the escape-clause procedure, may also be a consideration bearing on the national security position in particular cases, but the avoidance or remedy of injury to industries is not the object per se. There are other differences between the two procedures, such as that the one here under consideration applies to all imports whether or not the subject of trade agreement concessions. Again, in the choice of remedies the President is not limited in national security cases to actions which he might take under the authority delegated to him in the trade-agreements legislation. *However, it should be pointed out that the actions he may take under the authority of the national security amendment are limited to actions to adjust imports. In emergencies and for such time as necessary, the President may also take any action available to him under any of his other powers. Your committee considered it paramount to emphasize, however, that any action, large or small, for a short or long time, can be taken only if warranted by national security considerations. The interest to be safeguarded is the security of the Nation, not the output or profitability of any plant or industry except as these may be essential to national security.*

Subsequently, in House Report 1818, accompanying H.R. 11970, 87th Congress, enacted October 11, 1962, as the Trade Expansion Act of 1962 (76 Stat. 877), the Committee on Ways and Means commented as follows:

SECTION 232. SAFEGUARDING NATIONAL SECURITY

Except for conforming changes, section 232 is identical to, and continues in effect, the provisions of section 2 of the Trade Agreements Act approved July 1, 1954, as amended by section 8 of the Trade Agreements Extension Act of 1958.

Section 232(a) provides that no action is to be taken pursuant to the bill or section 350 of the Tariff Act of 1930 to decrease or eliminate the duty or to decrease any other import restriction on any article if the President determines that the reduction or elimination would threaten to impair the national security.

Section 232(b) provides that upon request, application, or notice from specified sources the Director of the Office of Emergency Planning (OEP) must undertake an investigation to determine whether the article is being imported

into the United States in such quantities or under such circumstances as to threaten to impair the national security. If he so finds, he is required to so advise the President, who is required to take such action as he deems necessary to adjust imports unless he determines that the article is not being imported in such quantities or under such circumstances as to threaten to impair the national security.

Section 232(c) enumerates various factors to which the President and the Director of the OEP are to give consideration in carrying out their functions.

Section 232(d) requires a report to be made and published on each final disposition of any request for investigation under section 232(b). It also requires the Director of the OEP to publish procedural regulations governing the exercise of the authority vested in him by section 232(b).

The House Committee on Interior and Insular Affairs wishes to point out the deep and continuing concern of other committees of Congress in the mandatory oil import program. In that respect, and without further extensive elaboration, attention is directed to the following:

1. Hearing held by the Select Committee on Small Business, House of Representatives, pursuant to House Resolution 46, 87th Congress, and House Report 2567.

2. Hearings held by the Select Committee on Small Business, U.S. Senate, 88th Congress, second session, entitled "Oil Import Allocations" and to the 14th and 15th annual reports of that committee.

3. Hearings before the Committee on Finance, U.S. Senate, 90th Congress, entitled "Import Quotas Legislation."

With respect to the last-named hearings, those before the Committee on Finance, U.S. Senate, Secretary of the Interior Stewart L. Udall, on October 18, 1967, testified with respect to oil imports as follows:

> I would like to state here my firm view that, in the present world petroleum situation, oil imports should be controlled in the interests of our national security. I think there has always been a strong case for this and there is today. This is the paramount, the only reason why such imports are controlled. In no sense does this position alter my views with respect to opposing trade barriers generally. But in the case of oil, our security would be jeopardized unless we have a strong, healthy, domestic oil industry, capable of meeting the demands of any conceivable emergency. One only has to look at the Middle East and what happened there a few months ago; Israel had to win or lose a war in a matter of days because of the fact that the mobility of their machines rested on very limited supplies of petroleum and I just use this to underscore what I mean.
>
> This we could not do if low-cost oil from petroleum-exporting countries were to flood this country, with consequent damage to our own energy-producing industries.
>
> The relationship between our national security and adequate supplies of oil is clear. On this score, it suffices to point out that oil is practically the sole source of energy for transportation—both civilian and military, and we are a highly mobile Nation.

Adequate domestic supplies depend upon exploration and discoveries and these activities will not be carried on in the absence of an adequate market for domestic production.

It was with these circumstances in mind that in 1957 the President's Special Committee To Investigate Crude Oil Imports reported to President Eisenhower that taking all factors into consideration, our national security requires the maintenance of some reasonable balance between imports and domestic production at this time, and as a result of that, the President took action that ended in 1959 in the mandatory program under Presidential proclamation. The report to President Eisenhower is as follows:

(The pertinent portions of the report prepared by the President's Special Committee To Investigate Crude Oil Imports and referred to by Secretary Udall have been previously cited and appear on pages 9–10 of this report. Secretary Udall again emphasized the national security role of import quotas in testimony before the House Committee on Ways and Means, June 4, 1968.)

Import Controls and the National Security

A basic question for consideration as a result of the testimony and statements given to this subcommittee is whether the same need exists today for control of imports of crude and unfinished oils as prevailed at the time that mandatory controls were adopted in 1959. It is noteworthy that none of the testimony offered during 3 days of hearings advocated discontinuance of import controls, although some parties would have exceptions made for special categories.

ESSENTIAL ROLE OF PETROLEUM

The role of petroleum in the life and industry of the Nation continues to be an essential one. In 1967, oil provided about 43 percent of all U.S. primary energy needs. Twenty years ago oil furnished 37 percent of energy requirements. In another 20 years, 1987, petroleum will supply an estimated 37 percent of all primary energy. In terms of volume of product consumed, 1967 demand was 12,277,000 barrels per day, which is 125 percent above that of 1947; and 1987 demand is expected to be 21,407,000 barrels per day, an increase of 74 percent above the present. Overall U.S. consumption of petroleum exceeded 4 billion barrels in 1967 which is approximately double the 1950 annual consumption. Natural gas consumption for 1967 exceeded 18 trillion cubic feet, about double the 1954 use. By 1980 it is projected that petroleum consumption will increase by approximately 2½ billion barrels to a total of 6½ billion barrels per year. At the same time consumption of natural gas is projected to increase by about 9 trillion cubic feet to give an annual consumption of 26 trillion cubic feet annually by 1980.

These projections mean that by 1980 this country's petroleum consumption will be nearly three times that of 1950, twice that of 1956, and 50 percent greater than in 1967. On the same basis by 1980 natural gas use will triple over that of 1953, double over that of 1958, and will be 50 percent greater than 1967. If these projections are

correct, and there is every reason to believe they are conservative, the United States will use almost as much oil and gas in the next 13 years as it consumed in all previous history. Best present estimates are that by 1980 this country must find between 75 and 80 billion barrels of oil.

It can be readily seen that the vital functions of our country rely heavily upon oil. As a primary source of energy, oil provides about 99 percent of our transportation requirements and 43 percent of our heating needs. Adequate amounts of oil cannot be stockpiled, as can some other minerals, and any interruptions of our source of supply, even for a few days or weeks would paralyze the commercial and industrial life of this Nation.

EMERGENCY ROLE OF PETROLEUM DEMONSTRATED IN 1967

The importance of having excess producing capacity available was demonstrated recently by the ability of the domestic oil industry to respond to requirements at home and abroad following the short Middle East war in June 1967. In the first full month (July 1967) following the disruption in crude supply for the free world, the U.S. oil industry increased its production of crude oil by 8 percent, or 750,000 barrels daily, over May, the last normal month. At the same time, total imports in July were off compared to May by 590,000 barrels daily, or 23 percent. Simultaneously, the industry was able to increase its exports of crude from virtually nothing in May to 274,000 barrels per day in July. These substantial increases in domestic production and exports were sustained as long as required. This was an example of the manner in which sudden demands can be forced upon the domestic industry.

DOMINANT POSITION OF FOREIGN OIL

The overwhelming availability of low-cost foreign oil will continue to threaten the domestic industry for the foreseeable future. At the present time, the United States and Canada together have reserves equal to about 13 years of production at current rates of demand, while the rest of the free world has 50 years of reserves on the same basis. Today, 87 percent of estimated free world recoverable reserves are located outside the United States and Canada. Foreign oil can be produced at per barrel costs that are a fraction of the cost of finding and producing oil in this country. Average per well production in the Middle East is over 5,000 barrels per day compared to average per well production in the United States of only 14 barrels per day. Considering only these relationships, there is little doubt that our own industry must continue to be protected to some degree if it is to remain viable.

EXPLORATORY EFFORTS AND RESULTS IN TERMS OF RESERVES

We can find other indications of the need to continue controls by examining statistics relative to exploratory effort and our Nation's oil reserves. For exploratory effort, there are several indicators, all of which are trending downward seriously, as the following table indicates:

Measures of exploratory activity

[1967 decline versus 1957–59 base period, percent]

Geophysical activity	[1] −38.4
Active rotary rigs	−47.1
Exploratory wells	−35.1
Total wells	−35.8

[1] 1966; data for 1967 unavailable.

Of even more serious portent is the outlook for known petroleum reserves, the magnitude of which is directly related to exploratory activity. New crude oil reserves found and developed have not kept pace with increasing demand and production, as reflected in the crude oil reserve ratio. This ratio, which expresses the relationship of developed reserves to current demand for crude oil, has declined from approximately 13 years in 1959 to a little under 10 years by 1967. This is a reduction of 23 percent since adoption of mandatory import controls, without which even greater decreases in the ratio would be expected.

If we project our present finding and exploration rate into 1980, the crude oil reserve ratio could conceivably be as low as 6 or 7 to 1. Simply to keep pace with the increasing demand over the next 15 years, the domestic industry must find and develop 50 percent more oil than it did during the past 15 years.

The volume of crude oil reserves found and developed during the past 7 years has averaged only 2.6 billion barrels per year in contrast to the average of 4.5 billion barrels estimated by the Department of the Interior as needed to meet future demand and maintain a satisfactory ratio of reserves to production.

The concern of this committee is that the United States will be unable to adequately meet this challenge. Consumption of oil is steadily increasing; discovery rates are declining and in recent years new discoveries have not kept abreast of increased production. During the last 10 years, 4 billion barrels more oil was used than in the previous period, but during this same time 4 billion barrels less oil was discovered than in the previous 10-year period. Thus, crude oil discovered during the last 10 years exceeded production by less than 1.1 billion barrels. By contrast during the period 1948–57 new discoveries exceeded production by 8.8 billion barrels. We are in fact presently living on reserves built up years ago. During the last 5 years the production-discovery ratio is even more unfavorable. Although slightly more oil was found in the last 5 years than in the previous 5-year period, the production increased by about 1.5 billion barrels. Consequently, in the last 5 years production actually exceeded discoveries by 12.5 million barrels. During the previous 5-year period discoveries exceeded production by 1.1 billion barrels. This trend is alarming and must eventually be reversed. Even more alarming is the fact that proven crude reserves in the United States at the end of 1967 were estimated at 31.4 billion barrels. This is down from a high of 31.7 billion barrels in 1961 and only slightly higher than 30 billion barrels estimated in 1955 when production was at a much lower level.

The oil import program raises serious implications for yet another important sector of the domestic fuels economy—coal—and for the Nation's future security as it relates to residual fuel oil.

Residual fuel oil to be used as fuel was included in the original proclamation issued by the President establishing the mandatory oil import control program in 1959. Since then, the proclamation as it relates to residual fuel oil has been repeatedly amended until now only a facade of control has been retained; in reality, imports are virtually unlimited under the "open end" system currently prevailing.

In 1959, imported residual fuel oil accounted for only 51 percent of the total heavy fuel oil consumed in district I, that portion of the United States located on the Atlantic seaboard.

At the present time, imported residual oil accounts for about 82 percent of total consumption in the area.

This growing dependence upon imported fuel in one of the most vital areas of the Nation is cause for concern.

It is cause for concern not only because it makes fuel consumers hostage to political and economic developments in foreign nations over which we can exercise only minimum control, but it emphasizes what appears to be a growing trend to turn over the entire fuel market in the area to foreign sources of supply.

The almost total reliance by district I fuel consumers on imported residual oil is also cause for concern because adequate provision has not been made, by major utilities and large industrial users, for quickly converting plants to use an alternate fuel, such as coal, in time of emergency. Such convertibility is now a requirement in some countries and if adopted here it could reduce the reliance of a vital area on the uncertainty of an imported fuel. It is recognized, however, that at this time and under existing conditions this area must continue to rely heavily upon imported residual oil.

Total imports of residual fuel oil have increased from 172 million barrels in 1959, when the control program was first established on a mandatory basis, to 345 million barrels in 1967. This latter figure represents foreign fuel in an amount equivalent to more than 82 million tons of domestic coal, an amount which is 15 percent of current annual production.

When total oil imports are considered—both crude and residual oil—the implications for the Nation assume alarming proportions.

Exceptions to the Program and Special Treatment Situations

Any restrictive Government program such as import controls which dispenses economic benefit to the participants must be accomplished in the most equitable manner possible; otherwise the integrity of the program is jeopardized, certain participants are severely penalized, and the general effectiveness of the program is reduced.

From the testimony presented to this committee, it appears that the administration of the import program has not met these goals.

THE ORIGINAL PROGRAM

The original control plan contained features that might have been eliminated quickly but instead were continued. One feature that has drawn considerable criticism by much of the oil industry over the years has been the historic guarantee feature, which favors certain

established importers. Such historic guarantees were probably justified at the outset because they permitted companies to recover their overseas investments which were made with the expectation of being able to import crude oil products into the United States without limit. The provision was also meant to avoid severe disruption to established supply patterns. The Presidential proclamation governing the program provides for a gradual phasing out of the historic guarantee feature, yet today major historical importers receive allocations as great as 12.3 percent of refinery runs, while the average award for the sliding scale group of refiners is only 6.4 percent. It would appear that after 9 years, the continued need for this feature should be reexamined and the phasing-out process accelerated.

Another unusual provision of the program is the mechanism termed a sliding scale, which governs all refiners except those with historic protection. The sliding scale makes proportionately smaller import allocations as the volume of a refiner's input increases. Thus, the smaller refiners receive a proportionately larger import allocation than do the larger refiners.

When the program was initiated, the smallest refiners in districts I–IV could import 12 percent of their refinery throughput, while refiners with inputs of over 300,000 barrels per day could import only 4 percent of that portion of their total runs.

In the intervening years the sliding scale has been changed, and the difference between import allocations of different classes of refiners has increased substantially. This year refiners in districts I–IV with runs less than 10,000 barrels per day are permitted to import about 19 percent of their input, while refiners at the other end of the scale can import only 3.5 to 4 percent of their input.

Another unusual feature arose early in the history of the program when a change in the regulations to exempt overland imports from Canada resulted in several northern tier refiners in Michigan, Wisconsin, and Minnesota being able to receive imported Canadian oil without restriction while still enjoying their historic allocations. This particular feature resulted in a substantial economic advantage to these few refiners. There have been many complaints against retention of this advantage, and although the special historic allocations are being phased out more rapidly than the regular historic quotas this feature is still retained although lately a change in the regulations provides a feature whereby the extent of the phaseout for these remaining northern tier refiners will be lessened.

EXCEPTIONS GRANTED SINCE 1965

From 1959 until late in 1965, the administration of the program was concerned primarily with various means of dividing the total amount of imports among oil companies which were participants in the control plan. Late in 1965, however, and in each subsequent year, there has been injected into the program a series of provisions which appear to be unrelated to the national security objective of import controls and which, incidentally, have resulted in special treatment situations which are of concern to this committee. The more significant ones are listed below:

1. Awards to Puerto Rico and Virgin Island refiners

On December 10, 1965, by Presidential Proclamation 3693, provision was made for a new form of allocation. The Proclamation stipulated that the Secretary of the Interior may make "allocations of imports of crude oil and unfinished oils into Puerto Rico to persons as feedstocks for facilities which will be established or for the operation of facilities which are established and which in the judgment of the Secretary will promote substantial expansion of employment in Puerto Rico through industrial development * * *." By this provision, a new criterion was injected as a basis for action on oil imports for purposes that are not clearly related to national security.

Under this new provision, two facilities in Puerto Rico have been approved. These involve the importation of 110,000 barrels daily of feedstocks to the Island, with further permission to ship 54,300 barrels daily of gasoline, jet fuel, and other products to the United States without restriction.

On November 9, 1967, by Presidential Proclamation 3820, the Secretary of the Interior was granted authority to allow up to 15,000 barrels daily of finished products to be shipped to the United States from a new refinery constructed in the Virgin Islands. The award was for a 10-year period.

A further grant occurred on December 15, 1967, when the Secretary of the Interior permitted a Puerto Rican refiner to move an additional 10,000 barrels daily of finished products to the east coast of the United States.

On the same date the Secretary also approved an application that will permit for 10 years the importation into Puerto Rico of up to 45,000 barrels daily of crude oil for use as petrochemical feedstock.

The net result of these allocations to island operations is that three historical refiners can bring approximately 177,000 barrels daily of crude and unfinished oils into Puerto Rico and ship 38,000 barrels per day of finished products to the U.S. mainland, the latter volume being considered outside the 12.2-percent limit on U.S. imports. In addition, new awards for petrochemical facilities in Puerto Rico provide for 185,000 barrels daily of crude that may be brought into Puerto Rico as feedstock. From this input, 64,000 barrels daily of finished products may be shipped to mainland markets. In addition 15,000 barrels per day may be brought in from a new refinery in the Virgin Islands.

When all authorized facilities are operating, the total volume of crude and unfinished oils moving to Puerto Rico may reach 362,000 or more barrels per day. For comparison, this equals 60 percent of all imports of crude and unfinished oils allotted to both sliding scale and historical refiners in districts I–IV in the first half of 1968.

The 79,000 barrels daily of finished products that eventually will move to the mainland will be considered as part of the total imports allowed into the United States, which means that it will be deducted from the total of all imports which otherwise would be divided among other refiners. This volume is in addition to approximately 38,000 barrels a day of finished products that historically have been shipped from Puerto Rico to the United States as an uncontrolled item of imports, outside the 12.2-percent limit.

All of the special awards described above were for the stated purpose of either improving employment opportunities, in the case of Puerto

Rico, or upgrading the quality of employment in the case of the Virgin Islands, where unemployment is not a factor. Despite these meritorious goals, the fact remains that the connection, if any, with the national security objectives of the oil import program has not been clearly established. In this respect, these special awards represent a use of the import control plan not contemplated by the authorizing legislation and contrary to the legislative history relating to the program.

2. Allocations for petrochemical companies introduced

Prior to 1966, allocations to import crude oil and unfinished oils were made only to refiners who processed the oil or exchanged their allocations for domestic crude oil. By Presidential Proclamation 3693 dated December 10, 1965, the program was amended to grant allocations to petrochemical plants, including those operated by chemical companies.

This new provision to include petrochemical companies in the import program was made on the basis that having access to foreign feedstocks would enable them to be more competitive in foreign markets, thereby increasing their exports from the United States which, in turn, would be the means of improving the Nation's balance of trade.

Petrochemical companies were awarded 30,000 barrels per day of the total controlled imports in districts I–IV, plus a small amount in district V. In each successive allocation period since then the set-aside for petrochemical use has been increased, to its present figure of 79,000 daily barrels for the second half of 1968. Sliding scale refiners have been reduced with each successive increase, since the allotted volume for petrochemical companies is provided for within the 12.2-percent limitation.

In the case of allocations for petrochemical companies, we again have the situation of a Government effort to improve the worldwide competitive ability of an industry and to improve the Nation's balance of payments, both by means of the oil import program. These two objectives certainly are extremely worthwhile, yet they are accomplished through the use of a Government program that was designed for an entirely different purpose—national security.

3. Foreign trade zones

The use of foreign trade zones by oil refiners and petrochemical manufacturers has been a controversial subject since the control program began. Two major chemical companies have now been granted foreign trade zones by the Foreign Trade Zones Board, and the Secretary of the Interior has been delegated authority by the President to control movement of foreign oil into such trade zones. From testimony presented, it appears to the committee that foreign trade zones, as they relate to the mandatory oil import program and the well-being of the domestic petroleum industry, would not be harmful *so long as they are used to encourage U.S. exports and are not used as a means of circumventing the basic import program.*

4. Fuel oil exemptions

Residual fuel oil, a low-priced byproduct of crude refining, has been handled separately since controls were instituted. Domestic supply has declined as U.S. refiners progressively up-graded crude oil to yield

more of the lighter and more valuable products. Eventually, residual marketers were given virtually unlimited access to foreign residual so that by 1966 imports of residual fuel were 84.4 percent of the total supply. This was an inevitable situation because of the refinery economics involved.

In recent months, however, there has been increased pressure from various groups for relaxation of controls of No. 2 heating oils. This situation is unlike that of residual fuel, for economics will permit refiners to turn out all volumes required to meet demand for No. 2 fuel oil. Testimony received by this committee has been to the effect that there has never been an actual shortage of domestic heating oils although there has been what was termed as a tight market situation. Unlike residual fuel oil, distillate heating oil is neither a byproduct nor is it unprofitable. Because of this, domestic refiners have always tried to gear supply to domestic demand. There is no reason to assume they are either unable or will not continue to do so.

Presidential Proclamation 3794 dated July 17, 1967 changed the definition of residual fuel oil which had been in effect since 1959. The effect of the change was to define No. 4 fuel oil, which previously was a product controlled within the 12.2 percent quota, as residual and, therefore, outside the quota. Thus, again the 12.2 percent quota was modified by an amount estimated at 25,000 barrels daily.

In another action early in 1968, the Oil Import Appeals Board granted 7,000 barrels daily of finished product quota to 12 fuel oil dealers. An additional 7,000 barrels daily was allocated July 8, 1968, to the Appeals Board. No finding of an actual shortage was made at that time. While the volume involved is not great, the significant fact is that many other fuel oil dealers hereafter could well expect similar treatment. This would further reduce the volume of imports available for distribution to oil refiners.[1]

Adherence to 12.2-Percent Limitation

The Secretary of the Interior has repeatedly pointed out that controlled imports have been held to the present relationship of 12.2 percent of domestic production since this ratio was introduced in 1962. Although this is true, it overlooks the fact that total imports, both controlled and uncontrolled, have steadily crept upward so that in

[1] Since May 1968 there have been seven publications in the Federal Register, changing or modifying existing regulations or proposing new regulations relating to the mandatory oil import program. These are as follows:

May 23, 1968—Allocation of Imports; Low Sulfur Residual Fuel Oil, Districts I-IV (proposed rulemaking).
June 4, 1968—Allocation to Petrochemical Plants (amendment 7).
June 14, 1968—Allocation of Imports; Low Sulfur Residual Fuel Oil, Districts I-IV (extended to July 15, 1968).
June 12, 1968—Imports into Puerto Rico of Crude Oil and Unfinished Oils (maximum level of imports).
July 2, 1968—Allocation of Imports; Crude Oil and Unfinished Oils (amendment 9).
July 11, 1968—Allocation of Imports; Crude Oil and Unfinished Oils (extended to July 17, 1968).
July 12, 1968—Allocation of Imports; Low Sulfur Residual Fuel Oil, Districts I-IV (extended to Aug. 5, 1968).

In addition to the above publications in the Federal Register the following announcements were made by the Department pertaining to the program:

July 29, 1968—Oil Import Totals for May 1968.
July 24, 1968—Petrochemical Oil Import Allocations for Last Half (1968).
July 9, 1968—Oil Import Allocations to Refiners for last 6 months 1968.
July 8, 1968—Oil Import Totals for April 1968.
June 10, 1968—Oil Import Totals for March 1968.
May 20, 1968—Refinery and Plant Inputs.
May 6, 1968—Oil Import Totals for February 1968.

1966 they were slightly more than 26 percent of domestic production. The figures for 1966 are as follows:

	Barrels
Average daily demand	11,850,000
Average daily crude production	9,579,000
Average daily imports	2,305,000

For comparison, imports were 21.2 percent of domestic production in 1960. Residual fuel oil represents much of the total of uncontrolled imports, but other factors contribute such as excess shipments from Canada, portions of product shipments from Puerto Rico, portions of bonded jet fuel, and some of the carryover of unused 1967 allocations. Thus, notwithstanding the controlled import plan and the 12.2 ceiling, the situation is simply that total oil imports into the United States now exceed 26 percent of domestic production.

The exceptions to the program granted since 1965 and which fall both within and outside the 12.2 limitation are summarized below:

1. Quotas within the 12.2-percent ceiling granted to (*a*) petrochemical production; (*b*) Puerto Rican and Virgin Island projects; (*c*) distributors of No. 2 fuel oil; and (*d*) a carryover of 1967 allocations not used. These total 141,000 barrels daily in 1968.
2. Canadian average of 60,000 barrels daily over and above the 12.2 ceiling.
3. Exemptions of 176,000 barrels daily in excess of the 12.2 ceiling, including bonded jet fuel and part of the 1967 carryover.

These exceptions to the program have increased from 100,000 barrels daily 3 years ago to 377,000 barrels daily at the present.

The program is now subject to pressures for various allotments that would fall both within and outside the 12.2-percent limit. Each special treatment sets precedent that invites further special treatment. The Presidential proclamation already has been amended to authorize the Secretary of the Interior to further increase imports outside the 12.2-percent ceiling. One estimate contained in testimony at the hearing placed the potential for increased imports because of new features of the program at 300,000 barrels daily. These may be summarized as follows:

	Barrels daily
1. Bonus imports for exports:	
(*a*) Petrochemical exports	50,000
(*b*) Oil exports	50,000
2. Asphalt imports	100,000
3. Bonus imports for producing low sulfur residual	[1] 100,000
Total	300,000

[1] Revised estimates are placed at 300,000 barrels daily.

The squeeze to which the program is being subjected can be illustrated by the fact that in the first half of 1960 total imports, exclusive of residual fuel, into districts I–IV were 847,000 barrels daily. In the first half of 1968, comparable imports are estimated at 1.1 million barrels daily, an increase of nearly 30 percent. During the same period, however, crude and unfinished oil imports allocated to refiners in districts I–IV declined from 719,000 barrels daily to 592,000 barrels daily—a drop of 18 percent.

Principal reasons for the decreased allocations to refiners were the substantial increase in shipments from Canada, the addition of chemical companies to the import control program, and the large awards

made to individual companies located in Puerto Rico and the Virgin Islands. Unless drastic changes occur in the direction in which the import program is headed, it was demonstrated that by 1972 there will not be adequate imports to allot to oil refiners and still take care of the many special situations. If this occurs, the reason for the establishment of the program, that is the assurance of a strong domestic petroleum industry in the interest of national security, will have been completely eliminated.

Committee Findings

The following points summarize the findings of the Subcommittee on Mines and Mining with regard to the present status of the mandatory oil import program, its effect upon the domestic petroleum industry, and its effectiveness in the enhancement of our Nation's security:

1. The need for control of foreign crude and unfinished oils in order to assure a healthy U.S. petroleum industry is as great today, from the standpoint of national security, as when the plan was conceived originally. The steady decline in the industry's exploratory effort over recent years and demonstrable inadequacy of known petroleum reserves accumulated have rather alarming implications from the standpoint of the Nation's security in times of emergency.

2. While the voluntary and mandatory oil import program has been helpful, its stated objective of preserving a "vigorous and healthy domestic petroleum industry for purposes of national security" has not been achieved. U.S. exploration and development has been declining for the past 10 or 11 years and even more alarming are the indications that unless steps are soon taken to reverse this trend it will continue at an accelerating rate. Instead of finding more than 4.5 billion barrels per year, which the Department of the Interior indicates are needed to meet future demands and maintain a stable reserve-production ratio, only 2.6 billion barrels per year have been found and developed during the past 7 years.

3. There is substantial evidence that the import program is weakened by the injection into the program of special treatment provisions, particularly since 1965. The profusion of these special treatment provisions threatens to undermine the program by destroying confidence in its administration and by creating special situations which permit imports both within and without the controlled levels.

4. The program is plagued by instability and frequent changes which create uncertainty and lack of a sense of direction. This makes it extremely difficult for segments of the industry to arrange their long-term expansion programs or to develop long-range plans.

5. The import program legally has only one basis for its existence; i.e., to protect the Nation's security by promoting a strong domestic oil industry capable of dealing with unforeseen emergencies. We find that the program is being used for many alien purposes. Many of these are undeniably worthwhile, yet all of them should be accomplished by means other than the oil import program. These include such activities as (*a*) economic aid to insular possessions and territories; (*b*) improvement in the Nation's exports; (*c*) enhancement of the competitive capabilities of the petrochemical industry; and (*d*) abatement of air pollution.

6. The program is beset by procedural irregularities in its administration. Some actions have been taken by the Secretary and the Oil Import Appeals Board without benefit of adequate notice or public hearings.

7. Declining exploration activity and declining crude reserves are endangering the health and well-being of the domestic petroleum industry and seriously endanger the national security of this Nation.

8. The import program is becoming increasingly complex and is burdened with confusing definitions and regulations so that participants are never sure as to how certain regulations should be interpreted or how they might be affected by future actions. These ambiguous definitions have resulted in conflicting decisions for like situations.

9. The relationship that controlled imports bear to domestic production—12.2 percent—has been adhered to as far as controlled imports are concerned but weakened by the exceptions permitted outside the 12.2-percent limit. Thus, the effectiveness of the entire program is weakened. The exceptions tend to be increasing at a rapid rate. In addition, total imports of oil into the United States exceeded 26 percent of domestic production for the year 1966. In many respects this is a more significant figure than the 12.2-percent limitation.

Committee Recommendations

1. The mandatory oil import program must not be weakened by use for purposes unrelated to the preservation of national security, regardless of the merits of the alien objectives. This includes projects such as improvement of the economic conditions in any particular geographic area, improvement of competitive conditions for any industry, alleviation of air pollution, economic hardships, or any other unrelated purposes.

2. All inequities in the program should be removed so that the Government is administering a plan that is equitable and fair for all who are governed by it. Features that should be carefully reviewed include the extent of the sliding scale method of allocation, the historic guarantee feature, special provisions for northern tier refiners, allocations to refiners located in insular possessions, allocations to customers of the petroleum industry and other allocations for purposes not basic to national security.

3. The program should be simplified to the greatest extent possible to eliminate the present chaotic condition which causes serious inefficiencies in the planning and operations of the entire petroleum industry.

4. Rules of procedure should be strengthened and observed so as to eliminate decisions made without benefit of adequate notice and public hearings. Amendments and changes to the regulations should be made in a formal, uniform manner; the granting of relief by the Oil Import Appeals Board should be done in accordance with established procedures of the Administrative Procedures Act.

5. Canadian sources of crude oil should continue to be considered within the scope of our national security planning and therefore should receive special treatment. However, participation of Canadian crude oil in our growing U.S. market must not be disproportionately greater

than the growth enjoyed by domestic producers. In the past, informal methods of managing such control have been arranged by the Department of the Interior and the Canadian Government. Such a method of control may well be continued but must be improved to prevent Canadian imports from consistently exceeding estimates.

6. It is the view of the committee that any program authorized under the national security provisions of the Trade Agreements Extension Act should be administered strictly in accordance with the purposes of that act and not extended to unrelated matters, notwithstanding the merit of such other programs.[1]

[1] Representative Kupferman, except for the air pollution aspect, took no part in the committee discussion.

DISSENTING VIEWS ON THE MANDATORY OIL IMPORT PROGRAM

INTRODUCTION

The undersigned members of the House Committee on Interior and Insular Affairs register their dissent from the report on the mandatory oil import program issued by the Committee on Interior and Insular Affairs and submit the following dissenting views on the subject.

Our basic reason for rejecting the committee report is that while the report reflects accurately the views, interests, and aspirations of the southwestern oil producing and refining States, it does not take due cognizance of the wider impact of the oil import control program on all Americans, not just those who produce or refine oil.

While the committee report makes frequent reference to the national security aspect of the oil import control program, it seems to equate the interests of our national security with the economic welfare of the southwestern oil producing States. We believe that national security has a broader horizon—geographically, economically, and politically—than is indicated in the committee report and that the oil import control program must be weighed in the spectrum of its total impact.

The committee report also fails to differentiate clearly in its analysis of the regulations governing the oil import control program between regulations which redistribute the existing volume of oil imports, and regulations which cause a change in the existing volume of imports. In our opinion the difference is essential, since the majority of the regulations criticized in the report fall in the first category and therefore do not affect the ratio of foreign crude oil to domestic crude oil consumed in this country.

Similarly, the report tries to fortify its contention that excessive regulations, exemptions, and exceptions have seriously weakened the program by treating adopted regulations and proposed regulations in the same vein, Yet, the record shows that the OIA has proposed many more regulations than it has enacted.

The report also ignores many of the factors other than imports which affect U.S. oil supply and demand, such as the interrelation between oil and other forms of energy, both new and old. Furthermore, by implying that virtually all negative trends observed in the U.S. oil industry are traceable to oil imports and to the regulations governing them the report creates the erroneous impression that whatever ails the domestic oil industry could be cured by a stricter application of import controls.

Finally, although the hearings on which the committee's report is based covered the entire United States, the majority specifically restricts its comments to the regions east of the Rocky Mountains, thereby pointedly ignoring the mass of testimony received which dealt with the oil import program on the west coast and in Hawaii.

Following is a more detailed analysis of some of the points stated above, with specific reference, where applicable, to pertinent sections in the committee report.

The National Security Issue

The signatories of these minority views are in agreement with the majority of the committee on the continuing need for an effective oil import control program for the United States. The uncontrolled importation of crude oil and those of its derivatives which are produced in sufficient quantities in the United States would seriously weaken the domestic crude and refining industry and make this country unduly dependent on foreign supplies for one of its most essential commodities. This principle, which has been endorsed and enforced by three administrations, is basically sound, in our opinion.

However, the Presidential proclamation on which the oil import control program is based, also recognizes the possible impact of the import restrictions on domestic crude oil and oil product prices. The proclamation states:

> In the event prices of crude oil or its products or derivatives shall be increased after the effective date of this proclamation, such surveillance shall include a determination as to whether such increase or increases are necessary to accomplish the national security objectives of the act of July 1, 1954, as amended, and of this proclamation.

This is a clear reflection of the concern of three U.S. Presidents with the effect of oil imports restrictions on domestic crude oil and products prices. Yet, in the committee report this concern is dismissed with the following single, vague reference:

> The subcommittee is not unmindful of the role of the consumer and his desire to obtain products at the lowest possible price. This desire, while temporarily beneficial is not, however, always consistent with national security benefits.

While we agree with the committee's conclusion "that the best interests of domestic consumers, as well as the national security can be best served by a reasonable balance between domestic and foreign supplies," we believe the extremely high cost of the oil import control program to U.S. consumer—$3 to $4 billion annually, equal to $15 to $20 for every person living in this country—is a matter of concern to the undersigned and should be a matter of concern in the committee report. We believe inflationary price increases, unrelated to cost, of essential commodities such as oil, could be just as serious a threat to our national security, in the wider sense of the term, as undue dependence on low cost but politically and strategically unstable overseas supply sources.

We believe, therefore, that in the absence of a specific overriding reason, any action on the part of Government or industry which would further increase the cost of the U.S. oil import program would not be in the public interest nor in the interests of our national security.

Future Domestic Oil Supplies

The committee report expresses concern "that the U.S. will be unable to meet the challenge" of future oil demand and maintenance

of a satisfactory ratio of reserves to production, in view of the decline in discovery rates and in the ratio of reserves to production in the face of a steadily growing demand. "This trend is alarming and must eventually be reversed," says the report, clearly implying that the oil import program should be used toward achieving this objective.

In other words, the committee report would appear to want still tighter import restrictions with consequent higher costs to consumers in order to encourage the search for domestic oil. We do not agree with this view. If, despite a strict import control program in existence since 1959, the rate of domestic oil discoveries should be unable to keep up with the growth in domestic oil demand, an enlightened resource conservation policy may eventually require a carefully controlled increase in the ratio of oil imports to domestic production in order to husband our economically recoverable domestic reserves.

However, unlike the committee report, the undersigned are not fearful that in the absence of substantially increased incentives (in the form of tighter import restrictions) our oil discovery rate will lag further and further behind our growing demand for oil. The recent vast discoveries of oil in Alaska, the potential for oil shale development, the obvious possibilities in the Texas gulf offshore area (for which the oil industry recently paid a total of $600 million in bonuses for the right of drilling concessions) and the reported potentials of other U.S. offshore areas currently under investigation by the industry, are all indications that our domestic reserves may be able to meet our domestic oil requirements in the foreseeable future without a change in the existing ratio of imports to domestic production. If this should not be the case, we would recommend an increase rather than a decrease in the ratio of oil imports to domestic production.

The 12.2-Percent Ratio

The committee report asserts that despite the maintenance o controlled imports at a level of 12.2 percent to domestic production in districts I–IV since the inception of the program, total U.S. oil imports in 1966 equalled 26 percent of domestic production, compared to 21.2 percent in 1960. According to the committee report, increases in residual fuel oil imports were the principal reason for the growth in the import ratio; but other factors also played a part in it.

The pertinent statistics show that residual fuel oil imports into district I rose by 459,000 barrels daily between 1960 and 1966. If imports of this product are deducted from total U.S. oil imports, the ratio of imports to total U.S. domestic production rose from 14.8 to 16.2 percent between 1960 and 1966. Thus, if we leave out residual fuel oil, the total ratio of imports to domestic production in the United States (districts I–V) has changed only very slightly in the 6-year period under analysis.

Inasmuch as domestic residual fuel oil production has been declining since the end of World War II, for economic reasons entirely unconnected with U.S. oil imports, and now supplies only about 10 percent of total east coast demand for this product, the increase in residual fuel oil imports has no effect whatever on the market for domestic crude oil. Hence, the maintenance of a healthy domestic oil-producing industry—the official aim of the import restrictions—is not jeopardized by the level of residual fuel oil imports. It is therefore incorrect

to include these imports in any measurement of the impact of oil imports on the domestic oil-producing industry, as is done in the committee report. For the importation of residual fuel oil into the U.S. east coast has not displaced—directly or indirectly—any domestic crude oil.

If the committee report intended by means of ratios to measure the overall dependence of U.S. consumers on foreign oil supplies, the inclusion of residual fuel oil in the total import figure would be legitimate. However, in that case the import data should be related to domestic demand—and not to production—since the question to be determined is what share of our total oil demand is supplied from less reliable foreign sources. Furthermore, if such a measurement is to have any meaningful relation to the question of national security, imports from Canada must be excluded from the total figure, since these imports are shipped into the United States by overland pipeline and must be considered as secure, politically and strategically as domestic supplies. This fact has been reflected in our oil import policy since 1959 and has been acknowledged in the subcommittee's report.

If we then relate total non-Canadian oil imports into the United States to total U.S. oil demand to measure the risk of relying on foreign supplies less reliable than domestic supplies, we obtain a ratio of 17.2 percent for 1960 and 18.2 percent for 1966. These ratios are considerably smaller than those quoted in the committee report and also show a much smaller increase for the years under study.

Thus, whether one wishes to measure the impact of oil imports on domestic production or the risk of relying on imports, the 12.2- and 26-percent ratios used in the committee report are conceptually misleading and exaggerated.

Furthermore, in contrasting the government's 12.2-percent ratio with the committee's 26-percent ratio, the committee report fails to point out that the 12.2-percent figure applies only to districts I–IV while the committee's 26-percent figure applies to the United States as a whole. The report misleads the reader into assuming the two ratios are comparable by stating that the limitation of controlled imports to "12.2 percent of domestic production since the program was introduced * * * overlooks the fact that total imports, both controlled and uncontrolled * * * in 1966 were slightly more than 26 percent of domestic production."

The overlooking in this instance was done by the committee which ignored the entirely different bases and concepts of the two ratios in order to make its point. The misleading contention is repeated in paragraph 9 of the committee's findings which holds that the 26-percent ratio "is in many respects a more significant figure than the 12.2-percent limitation."

The fact is that, except for residual fuel oil imports which, as explained above, do not displace domestic oil, the ratio of total oil imports (within and outside the 12.2-percent limit) into districts I–IV were equal to 12.8 percent of production in districts I–IV in 1966. Thus, with all the exceptions and exemptions objected to by the committee, the pertinent ratio of oil imports to domestic production has remained virtually unchanged since the inception of the program.

Regarding the argument implied in the committee's report that the residual fuel oil imports should be included in the import ratio, we would only like to point out that Senate bill S. 2332 (sponsored by

Senator Long of Louisiana) which had the wholehearted support of virtually all independent domestic crude oil producers, specifically excluded residual fuel oil from its proposed statutory limit of imports to 12.2 percent of domestic production in districts I–IV.

We would emphasize that no restrictions whatever are now put on importation of residual oil into the U.S. east coast, and none should be. Furthermore, in view of rising concern over the problem of air pollution caused by sulfur emission from burning of most fossil fuels, the substitution of low-sulfur fuel oil for the high-sulfur variety should be encouraged.

Carryover Allocations

The committee report lists "carryover of the 1967 allocations not used" among "the exceptions to the program granted since 1965." The inclusion of these carryovers in the list of exceptions "both within and outside the 12.2-percent limitations" without explanation can only reflect the committee's apparent desire to criticize every feature of the import program regardless of its true purpose and merit. The carryover of unused import licenses from 1967 is of course not a regular exception to the program but reflects a special nonrecurrent situation created by the Middle East crisis which, incidentally, greatly benefitted U.S. domestic oil producers.

The import allocations in districts I–IV for 1967 had been set at a total of 1,060,000 barrels daily, which was equal to 12.2 percent of the estimated production of 8,724,000 barrels daily in districts I–IV. Because of the dislocation caused by the Middle East crisis, imports in 1967 amounted to only 900,000 barrels daily while production rose to 9,083,000 barrels daily. Thus, in 1967, imports into districts I–IV equalled less than 10 percent of production, instead of the permissible 12.2 percent. In order to protect importers who were unable to use their allocations in 1967 against losses, the Government established a 2-year carryover program. The carryover program will still leave total import allocations for the 3-year period 1967–69 below the 12.2-percent ratio so that domestic producers during that period will have a larger share of the U.S. oil market than they would have had if importers had actually imported an oil volume equal to 12.2 percent of production in 1967 in districts I–IV. Nor does the carryover program grant any additional or new allocations to some importers at the expense of others. The carryover program was an imaginative scheme developed by the OIA to cope with an unusual and unforeseeable situation. To list it among the examples of the "special treatment situations which are of concern to this committee" is an indication of the tendentiousness of the committee report.

Puerto Rico and the Virgin Islands

In dealing with the application of the oil import control program to Puerto Rico and the Virgin Islands, the committee report accurately reflects the criticisms voiced by several segments of the U.S. oil industry against the granting of mainland import licenses to new refiners located in those areas. However, it all but ignores the explanations given by officials of the Interior Department before the committee for granting the import licenses.

The creation of a large-scale petrochemical and petroleum refining industry in these U.S. offshore areas was of great importance to the economy. The request to permit the establishment of such plants (which would probably have been uneconomical without access to the U.S. mainland market for a share of the products made in those plants) came not from private industry but from the governments of these territories. Had the Secretary of the Interior rejected their request this would not only have significantly retarded the economic growth of the areas but it might also have been viewed as a discriminatory act on the part of the U.S. Government. The potential national security implications of both the economic and the political consequences of a flat denial of the applications are obvious, particularly in the case of Puerto Rico which represents the U.S. "showcase" in Latin America. It is unfortunate that the committee did not address itself to these aspects of the Puerto Rican oil import issue, which are certainly not unrelated to our national security.

Furthermore, in discussing oil imports from Puerto Rico into the U.S. mainland the committee report refers to "uncontrolled items of imports." This is misleading since all imports from Puerto Rico, whether within or outside the 12.2 percent limitation, are strictly controlled by the OIA and cannot increase under existing regulations.

Finally, regarding the awarding of import licenses to refiners in U.S. offshore areas, we believe the question is not whether the awards were justifiable on the basis of some national security criteria but whether the Interior Department's method of selecting the companies which received the award satisfied customary standards of equity in all cases. There are indications that some oil companies believe this was not the case. Unfortunately, the committee report does not address itself to this subject.

Distillate Fuel Oil Imports

We agree with the committee report that the domestic distillate fuel oil supply situation "is unlike that of residual fuel oil, for economics will permit refiners to turn out all volumes required to meet the demand for No. 2 fuel oil." However, we regret that the committee report completely failed to take note of the unsual counter-seasonal increase in No. 2 fuel oil wholesale prices at the U.S. east coast last April, although this increase was the subject of considerable discussion at the hearing.

While the undersigned recognize the possibility that the special circumstances of the Middle East crisis may have had an indirect effect on east coast prices, we nevertheless are concerned with the price increase in domestic heating oil and so should be the administration under the aforementioned directives contained in the Presidential proclamation establishing the import control program.

Perhaps adoption of the proposal made at the hearings that refiners be given added flexibility to exchange crude oil imports for distillate heating oil imports within the limits of their total import quotas, would reduce the possibility of temporary supply tightness during the heating season with its consequent threat to the stability of heating oil prices.

37-143 O - 74 - 4

Stock Levels

The committee report states that "adequate amounts of oil cannot be stockpiled, as can some other minerals, and any interruption of our source of supply, even for a few days or weeks would paralyze the commerical and industrial life of this Nation."

The fact is that total U.S. crude oil and products stocks are currently equal to 78 days of demand. Assuming that about 30 percent of these stocks are not available for shipments because they are required for the continuous operation of equipment, our readily available inventories are equal to about 55 days of current consumption. The committee's statement exaggerates therefore the short-term risks of dependence on foreign oil supplies.

Hawaii

Considerable testimony has been received during the hearings regarding the special situation of Hawaii within district V. Located 2,300 miles west of the mainland and devoid of any indigenous fuel supplies, all of Hawaii's fuel needs must be delivered by tanker across the open sea, whatever their source of origin. Hawaii also has no access, obviously, to overland oil sources from Canada and Mexico.

Testimony has shown that over 90 percent of the State's oil supplies are of foreign origin. The crude oil refined in Hawaii by Standard Oil of California comes from Iran, Saudi Arabia, and Indonesia. Yet, because of the workings of the oil import control program, Hawaii enjoys none of the economic benefits of this lower-cost foreign oil. On the contrary, retail prices of most petroleum products, even though produced in Hawaii, are higher in Hawaii than anywhere on the U.S. west coast; the price is arbitrarily set as though produced on the west coast and includes a fictitious transportation cost as though it were shipped to Hawaii.

We believe it is regrettable that the committee has ignored the massive testimony presented by all segments of the Hawaiian economy to the effect that Hawaii should be exempted from the oil import control program.

We believe the Interior Department and the Office of Emergency Planning should be requested to undertake an investigation into the oil import control program as it applies to Hawaii, to determine whether this State, in view of its geographic location, should be treated differently under the mandatory oil import program than the rest of district V.

We are aware that counter arguments to the above were presented to the committee. The claim that the situation in Hawaii is essentially not unlike that of the U.S. east coast, which is also an oil deficit area and must receive all its crude oil supplies and a large part of its oil products by ocean tanker, is the failure to recognize the point in issue. Furthermore, it is said that as part of district V Hawaii could fully count on oil supplies produced within that district if foreign oil should become unavailable. This difference of opinion underscores the need for an investigation.

While the committee report has gone to great lengths to include the thinking in the past on the oil import program, it has seriously neglected consideration of the future. We believe that the national

security this program was designed to protect includes not only preparation for defense in unforeseen emergencies, but also the daily well-being of all America's people. Therefore, we regard such objectives as abating air pollution, promoting consumer interests, and alleviating economic hardships in a U.S. offshore territory as intrinsic—not alien—to our national security.

The oil import program was established and should continue to exist for the achievement of the best possible, and most secure, balance of foreign and domestic petroleum supplies. But in so doing, it must be recognized that other areas of national security are and will be affected and should be taken into consideration if the broad objective of the program is to be fulfilled.

We, the undersigned members of the House Committee on Interior and Insular affairs, for the reasons stated above, hereby oppose the views and comments in the committee report on the mandatory oil import program.

JOHN V. TUNNEY.
BOB KASTENMEIER.
LLOYD MEEDS.
PATSY T. MINK.
THOMAS S. FOLEY.
HUGH L. CAREY.

ADDITIONAL DISSENTING VIEWS ON THE MANDATORY OIL IMPORT PROGRAM AS IT RELATES TO THE DOMESTIC PETROCHEMICAL INDUSTRY

We disagree with the committee's findings that "the import program legally has only one basis for its existence, i.e., to protect the Nation's security by promoting a strong domestic oil industry capable of dealing with unforeseen emergencies." The national security determination is based on many factors including, but not limited to, the many sectors of the domestic oil industry. The need for a strong, healthy, domestic petroleum producing industry, one capable of quickly increasing domestic production, is recognized. But, a growing and vigorous and competitive domestic petrochemical industry is just as essential to our national security. If governmental policies protect the domestic petroleum industry, these same policies must protect and not hinder our third largest manufacturing industry, the domestic petrochemical industry.

In a recent report prepared by the National Academy of Sciences and submitted to the Office of Emergency Planning in December 1967, the importance of the petrochemical industry to our Nation's security was succinctly stated as follows:

> Because of its tremendous technical capabilities, the petrochemical industry (PCI) would be a prime source of strength to the Nation in a time of emergency. It is contributing to every facet of the economy and is uniquely suited to supply the imagination and broad perspective for quickly finding alternate sources of supply and producing substitute materials during an emergency in the critical areas of (*a*) food and agriculture, (*b*) clothing, (*c*) shelter, (*d*) transportation, (*e*) communications, and (*f*) medical supplies.

This basic industry marshals an investment of $19 billion and a large and skilled work force of more than 320,000 employees for the production of thousands of chemical and plastic products essential to our national defense and to almost every aspect of our national existence and is a major, positive contributor to our country's balance of trade. This industry must, however, have access to the same low-cost raw materials which its foreign competitors enjoy in order to maintain its domestic and international markets and to expand its domestic facilities. As a result of the oil import program, the price of U.S. crude oil is 60 percent above the world market price. This price differential has the same significant effect on the feedstock cost of petrochemical producers.

Petroleum products are the fundamental raw materials of the petrochemical industry. Natural gas liquids, the feedstocks on which the domestic petrochemical industry is largely based, are moving higher in price because the demands of the petrochemical industry are expanding more rapidly than the availability of natural gas

liquids. The domestic supply of feedstocks cannot be increased by use of heavier liquids from crudes because they have been made prohibitively expensive from a competitive standpoint by the oil import program. In contrast to the situation in the United States, foreign producers are under no such restraints. They have unrestricted access to petroleum feedstocks at lower world prices.

For these reasons, adequate access to foreign feedstocks is fundamental to the health and growth of the domestic petrochemical industry.

A great deal is at stake:

1. The continued growth of U.S. exports of petrochemical products. Petrochemicals currently contribute more than $1.1 billion a year to the Nation's balance of trade. These exports will inevitably go the way of the steel industry's exports, but for different reasons, if the burdens of higher raw material costs are added to the adverse effects of the Kennedy round tariff changes.

2. The potential loss of a significant part of the domestic market for petrochemicals—a market whose size by 1972–75 will double and reach an estimated $35 billion. Lower raw material costs combined with lower tariffs will give overseas products a running start on sales in the U.S. market.

The American consumer uses petrochemical products in nearly every area of his daily life. Therefore, needlessly high domestic prices for these products places an extra and unnecessary burden on him.

3. The possible outflow of large numbers of jobs and large sums of capital. If the petrochemical industry is unable to remain competitive from plants in the United States, it can only retain its market share by investing in foreign plants. Among many others, this would hurt the very domestic petroleum industry which the oil import program is designed to protect, because overseas plants will not use domestic petroleum, either as feedstocks or as fuel.

These are the clearly foreseeable consequences unless the domestic petrochemical industry is allowed the access to the same low-cost raw materials which its foreign competitors enjoy.

It should be pointed out that despite the fact that the petrochemical industry is the third to largest manufacturing industry in the United States, its demands for petroleum raw materials are small in comparison to the quantity of the oil going to the fuel and energy markets. This industry uses less than 5 percent of the total domestic demand for oil and natural gas liquid.

The statement by the committee that "in each successive allocation period since then [1965] the set-aside for petrochemical use has been increased to its present level of 79,000 daily barrels * * *" is erroneous. In 1966, 57,000 barrels per day were allocated via petrochemical or refinery quotas for production of petrochemicals in districts I–IV—not 30,000 barrels per day. In 1967, the petrochemical industry received allocations totaling 67,000 barrels per day and in the first half of 1968, the industry received allocations totaling 81,000 barrels per day. In the last half of this year, the industry will receive allocations of 79,000 barrels per day, compared with allocations of almost 1 million barrels per day for energy uses and imports of almost another 1 million for residual fuel.

We would recommend that the committee determine whether or not a petrochemical industry oil quota program should be established

pursuant to an independent national security determination. The essential feature of this recommendation is a recognition of the distinction between the primary fuel and energy markets of the petroleum industry and the petrochemical industries. The import for export program called for by the latest Presidential proclamation governing the oil import program should be implemented as soon as possible.

We, the undersigned members of the House Committee on Interior and Insular Affairs, for the reasons stated above, hereby oppose the views and comments in the committee report on the mandatory oil import program as it relates to the domestic petrochemical industry.

HUGH L. CAREY,
JOHN V. TUNNEY,
LLOYD MEEDS,
PATSY T. MINK.

SEPARATE DISSENTING VIEWS TO THE REPORT ON THE MANDATORY OIL IMPORT PROGRAM

We are voting against the committee report on the mandatory oil import program for a number of reasons:

1. The report admittedly does not deal with the problems existing in district V (which includes Alaska, Arizona, California, Hawaii, Nevada, Oregon, and Washington).

2. In a matter of this importance, we do not feel that the 3 days of hearings allowed sufficient time (particularly at the busiest period of the congressional session) to evaluate the many factors that must be weighed in this all-important area. We would like to hear more extensive testimony regarding the impact this program may have, if any, on air pollution, consumer prices, exploration and development incentives, and national security.

3. In our opinion, it is not possible on the basis of the hearings held thus far to form a considered and informed judgment on this very complex matter. It would have been preferable to hold more extensive hearings and we believe it would be highly desirable that the committee do this next year.

PHILLIP BURTON.
WILLIAM F. RYAN.

VIEWS OF REPRESENTATIVES RYAN AND KUPFERMAN

The quality of our environment is a matter of grave national concern. Air pollution may not yet be a major problem in certain sections of the southwest oil-producing States, but it is an inescapable fact of life for Americans living in urban areas across the country. Every program undertaken by the Federal Government should be administered, wherever possible, to improve the quality of our environment.

Therefore, it is most disturbing that the report on the mandatory oil import program adopted by the committee describes the alleviation of air pollution as a purpose alien to the mandatory oil import program. Furthermore, the committee recommends that the program should not be used to alleviate air pollution. I cannot accept this narrow and restrictive approach which would deny the Secretary of the Interior the authority to utilize this program in order to remove impurities from the air.

That high-sulfur residual oil causes serious damage to health, even death, through air pollution is incontrovertible. It is not in the national interest, in effect, to censure the Secretary of the Interior for the steps he has taken to increase the amount of low-sulfur residual oil available in the United States. The Secretary acted wisely when he promulgated revision 5, section 11A, of the oil import regulations, which provides that for each barrel of low-sulfur residual oil distilled from imported crude oil, a company is allowed to import another barrel of oil without it counting toward its quota.

Following the Secretary's actions, the Los Angeles Department of Water & Power ordered that power companies now must burn low-sulfur (less than 0.5 percent) fuel all year round. Formerly, these companies were permitted to burn high-sulfur residual oil, a situation which greatly aggravated Los Angeles' critical air pollution problem.

Unfortunately, the Secretary's order covers only district V which contains those States west of the Rocky Mountains. The Oil Import Administration has published a tentative proposal to the Secretary, including the recommendation that he order a similar type of credit reimbursement program for districts I–IV which includes the east coast and the rest of the country. It is essential that the Oil Import Administration press for a credit reimbursement program in its final proposal.

At the present, three major east coast areas, New Jersey, New York City, and Washington, D.C., have air pollution laws limiting sulfur content. The governments in these areas have set the following schedules:

New Jersey State regulations for residual fuel oil applicable to the entire State except for certain rural counties are as follows:

Date	Sulfur limit (percent)	Fuel user
May 1, 1968	1.0	All residual fuel oil users.
Oct. 1, 1970	.5	Do.
Oct. 1, 1971	.3	Do.

New York State regulations for residual fuel oil applicable to the New York City metropolitan area are as follows:

Date	Sulfur limit (percent)	Fuel user
October 1, 1968	1.0	Powerplants in New York, Bronx, and Kings Counties.
October 1, 1969	1.0	Powerplants in the remaining New York City metropolitan area.
October 1, 1969	.3	All residual fuel oil users except powerplants.

Maryland State regulations for residual fuel oil are applicable to Montgomery and Prince Georges Counties. In addition, ordinances of certain northern Virginia communities in the Washington, D.C., metropolitan area provide for identical limits as follows:

Date	Sulfur limit (percent)	Fuel users
July 1, 1968	1.5	All residual fuel oil users.
July 1, 1969	1.0	Do.

It is clear that the demand for low-sulfur residual oil is going to increase in these areas in the future. In addition, it must be expected that governments in other major urban areas along the east coast and other sections of the country will be forced to enact air pollution control laws in the very near future, further increasing the pressure on the market for low-sulfur residual oil.

It is clearly vital to the interests of the great majority of Americans that as much clean burning fuel as possible be on the market at a reasonable price.

When the Oil Import Administration published its tentative proposal on May 24, Secretary of the Interior Udall said:

> The purpose of the proposal is to permit fuel oil users on the east coast to meet Federal, State, and local air pollution regulations. Air pollution is one of this Nation's most dangerous environmental hazards, and the Federal Government is totally committed to control this hazard with all of its available resources, including the oil import program.

Certainly the Secretary of the Interior should order exemptions for districts I–IV similar to those now granted in district V. He should not be thwarted in any respect. The concern for the health of our citizens must be a paramount consideration.

WILLIAM F. RYAN,
THEODORE R. KUPFERMAN.

91st Congress
2d Session

COMMITTEE PRINT NO. 1

REPORT

ON

THE OIL IMPORT QUESTION

(TOGETHER WITH DISSENTING AND SEPARATE VIEWS)

SUBCOMMITTEE ON MINES AND MINING

OF THE

COMMITTEE

ON

INTERIOR AND INSULAR AFFAIRS

OF THE

HOUSE OF REPRESENTATIVES

AUGUST 1970

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

---

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON : 1970

COMMITTEE ON INTERIOR AND INSULAR AFFAIRS

HOUSE OF REPRESENTATIVES

WAYNE N. ASPINALL, Colorado, *Chairman*

JAMES A. HALEY, Florida
ED EDMONDSON, Oklahoma
WALTER S. BARING, Nevada
ROY A. TAYLOR, North Carolina
HAROLD T. JOHNSON, California
HUGH L. CAREY, New York
MORRIS K. UDALL, Arizona
PHILLIP BURTON, California
JOHN V. TUNNEY, California
THOMAS S. FOLEY, Washington
ROBERT W. KASTENMEIER, Wisconsin
JAMES G. O'HARA, Michigan
WILLIAM F. RYAN, New York
PATSY T. MINK, Hawaii
JAMES KEE, West Virginia
LLOYD MEEDS, Washington
ABRAHAM KAZEN, JR., Texas
BILL D. BURLISON, Missouri

JOHN P. SAYLOR, Pennsylvania
Ranking Minority Member
E. Y. BERRY, South Dakota
CRAIG HOSMER, California
JOE SKUBITZ, Kansas
LAURENCE J. BURTON, Utah
JOHN KYL, Iowa
SAM STEIGER, Arizona
HOWARD W. POLLOCK, Alaska
JAMES A. McCLURE, Idaho
DON H. CLAUSEN, California
PHILIP E. RUPPE, Michigan
JOHN WOLD, Wyoming
JOHN N. HAPPY CAMP, Oklahoma
MANUEL LUJAN, JR., New Mexico

JORGE L. CÓRDOVA,
Resident Commissioner, Puerto Rico

SIDNEY L. MCFARLAND, *Staff Director and Chief Clerk*
LEWIS A. SIGLER, *Counsel*

MINES AND MINING

ED EDMONDSON, *Chairman*

WALTER S. BARING
HUGH L. CAREY
PHILLIP BURTON
THOMAS S. FOLEY
JAMES G. O'HARA
JAMES KEE
ABRAHAM KAZEN, JR.

LAURENCE J. BURTON
E. Y. BERRY
CRAIG HOSMER
JOE SKUBITZ
JAMES A. McCLURE
PHILIP E. RUPPE
JOHN WOLD

WILLIAM L. SHAFER, *Consultant on Mining and Minerals*

NOTE.—The chairman, Hon. Wayne N. Aspinall, and the ranking minority member, Hon. John P. Saylor, are ex officio members of each subcommittee.

THE OIL IMPORT QUESTION

INTRODUCTION

The Subcommittee on Mines and Mining of the House Committee on Interior and Insular Affairs held hearings on the oil import-oil tariff question that was raised by the divergent views expressed in the report of the Cabinet Task Force on Oil Import Control. The task force report was released February 20 and subcommittee hearings commenced March 9 and extended through March 10, 16, and 17 and April 6, 7, 23, and 24, 1970. Represented at the hearings were major segments of the petroleum and natural gas industry, including both independent and major operators and producers, refiners, the coal industry, the petrochemical industry, research groups and others interested in either the production, distribution or consumption of coal, petroleum, and natural gas products.

In releasing the task force report, President Nixon commented that the members did not reach unanimous agreement on a set of recommendations. The President also recognized and stated that "The Congress properly has a vital interest in this program which affects every area of our country and many facets of our economy. Committees of both the House of Representatives and the Senate have indicated interest in holding hearings on the oil import program and any recommended changes in it. I expect that much additional valuable information will result from these congessional hearings, and I direct the Oil Policy Committee to carefully review all such information." The hearings held by this subcommittee are an indication of the congressional interest referred to by the President and were intended to provide a forum by which the findings and recommendations of the Cabinet task force could be reviewed.

Although extensive consideration was given to the matter of oil import quotas versus tariffs by the Cabinet task force, no open public hearings were held and no opportunity was afforded for questioning or for cross examination of those individuals submitting material. In contrast to this, the subcommittee hearings were open public hearings and all witnesses were subject to questioning by members of the subcommittee.

Before proceeding further it appears appropriate to point out that this subcommittee held extensive hearings on the Mandatory Oil Import program in 1968 and submitted a report on its findings and recommendations in August of that year. Those hearings and the report give much of the background and the operation of the Mandatory Oil Import from its inception in 1959 up to and including 1968. For that reason it appears unnecessary to repeat much of that information in the present report either as to the origin and operation of the program or as to the committee's findings and recommendations. Suffice it to say that the majority views of the committee, while recognizing some de-

fects in the administrative operation of the Mandatory Oil Import program, strongly recommended it be retained and strengthened. In that report it was stated as follows:

> If a meaningful program is to be continued, it is imperative that a clear and definite policy be established under which the domestic petroleum industry and all others interested are fully informed as to the future of the program. If national security is of paramount consideration, and this Subcommittee firmly believes that it is, together with the preservation of the domestic petroleum industry, then no further exceptions should be granted. If, on the other hand, the program has outlived its usefulness or if considerations other than national security are to be given equal or greater weight, whetheer these be situations of hardship, price or temporary shortage, then the new criteria should also be clearly spelled out and defined in order that all may follow the newly established policy.

Upon completion of the recent hearings the subcommittee is not aware of anything that would substantially alter the above general conclusion.

Task Force Majority Conclusions

Careful reading of "The Oil Import Question"—the official report of the Cabinet Task Force on Oil Import Control—is sure to leave some confusion in the reader's mind regarding the "majority position" in the task force.

Most of the newspaper publicity commenting upon the report identifies Task Force Chairman (and Secretary of Labor), George Schultz; Office of Emergency Preparedness Director, George Lincoln; Secretary of Defense, Melvin Laird; Secretary of the Treasury, David Kennedy; and Secretary of State, William Rogers as members of the task force "majority."

These officials, presumably, reported to the President in support of "a phased transition to a tariff system for controlling imports, to take initial effect no later than January 1, 1971, with the following principal features:

(1) Initial imposition of an increased tariff on nonpreferred crude oil at a level $1.35 per barrel above existing tariffs;

(2) Phaseout of special quota privileges over a 3-year transition period by means of a "tariff-free" quota;

(3) Deferment of decision on further tariff liberalization until January 1972, at which time the program managers may continue the process of liberalization if they are then persuaded on the basis of the best available evidence that indicated reserves in North American frontier areas will be sufficient to meet the aggregate 1980 production estimates set forth herein, or until January 1973 or January 1974 if the program managers are so persuaded by then;

(4) A comprehensive review of the program no later than 1975, including an in-depth study of the post-1980 situation, to determine whether it then appears consistent with the national security to continue—or, if need be, arrest or reverse—the process of tariff liberalization.

Other principal recommendations in the report call for special tariff rates on residual fuel oil as well as finished products and unfinished oils, for Western Hemisphere preferences, transitional quotas, the auctioning of Eastern Hemisphere import licenses under some conditions, a management system headed by the Director of the Office of Emergency Preparedness, and further studies of security alternatives.

These far-reaching recommendations proceed from a series of findings and conclusions about oil prices, domestic exploration and production potential, and potential savings to the American consumer which are set forth in the report's "Summary of Security Analysis."

The most spectacular of these findings is the much-publicized statement that "American consumers would save about $5 billion annually now and over $8 billion annually by 1980" as a result of the abandonment of import controls. Approximately a page and a half beyond the report's spectacular claim of $5 billion annual savings to American consumers under the proposal appears the significant conclusion;

> At a $2 price, imports could amount to about 51 percent of domestic demand. Perhaps half of these imports would be from the Eastern Hemisphere; about 40 percent of all imports—or 20 percent of domestic demand—would be from Arab sources.

Notwithstanding the recognition in the majority views of the essential nature of Eastern Hemisphere oil in the accomplishment of the dollar savings for American consumers claimed as a majority report result, the majority "Conclusion" is stated at page 131 of the report:

> National security will be adequately protected by adopting as a first step a revised control system and a modest immediate reduction in important restraints. Further liberalization appears to be warranted, but a decision on the timing and extent of subsequent relaxation in the level of restrictions should await the development of additional information about the productive potential of North American "frontier areas."

All of the conclusions and findings referred to are generally described as majority views, but the report very significantly contains a series of "supplementary views" which are credited to members of the majority—supplementary views which for all practical purposes appear completely inconsistent with the publicized majority position.

For example, the Secretary of State, while agreeing that "changes in the oil import system are required and that the proposed new system represents a move in a desirable direction," nonetheless "emphasis, however, that basic changes in an oil import program of longstanding might provoke serious adverse reactions which could have an important bearing on national security." The Secretary of State, in supplementary views, makes it clear that "full consultations with other governments will be necessary to enable the Department of State fully to assess the national security and foreign policy ramifications of the proposed changes," and warns that "amendments to the program" may be necessary "in the light of those security considerations."

Another majority member, the Secretary of the Treasury, strongly warns that the projected 1972 tariff liberalization should be undertaken "only if such action seems prudent to the program managers in light of an objective and independent appraisal of actual domestic explora-

tory drilling and other then-current information, including the results of an in-depth review of the post-1980 period." The Secretary further emphasized: "Our domestic industry will be expected and encouraged to continue to expand its output and to explore for and develop new sources of crudes and substitutes; the revised oil import control system should be so managed as to work toward this goal." Certainly this charge to the Government and industry should be heeded in all respects, yet it would fall short of accomplishment if the industry were forced to operate under the economic disincentives outlined in the report of the taks force majority. This same Cabinet member also commented that "changes in import levels and not predetermined price objectives should guide the program managers."

Most important as a qualification of the majority position is the statement of of the Secretary of Defense in his "supplementary views." The Secretary of Defense, for example, warns that "the tone of the report does infer a capability of reacting to an oil emergency that may be somewhat optimistic."

The Secretary of Defense makes it clear that he believes "the question of residual fuel oil has not been adequately analyzed and * * * the effects of virtually free access to foreign residual oil on U.S. markets and U.S. refining capabilities have been such as to make the continued exemption of residual oil from import controls open to question." He strongly urges that the entire subject of residual oil be studied as quickly as possible.

These concluding conditions stated by the Secretary of Defense appear as pages 132 and 133 of the report:

> Further, from a national security standpoint it is extremely important that the program be carefully administered and security considerations be paramount. As a member of the Interdepartmental Policy Panel the Secretary of Defense would consider the following to be essential.
>
> (*a*) That domestic exploration be maintained at approximately current rates and that no reduction in reserves be allowed.
>
> (*b*) Tariffs be changed only after security needs have been satisfied.
>
> (*c*) Changes in import levels be accomplished slowly and gradually. He strongly objects to a schedule on levels of imports which will widely fluctuate, either up or down, from any source.
>
> (*d*) Continuous surveillance to prevent the reduction of the United States—or—U.S.-controlled tanker fleet. An in-depth review of any adverse effects of the relaxed controls on the United States—or—U.S.-controlled tanker fleet and shipbuilding industry should be performed.
>
> (*e*) An in-depth review of the post-1980 period. While higher imports in the next decade might be without security risks, we must look beyond 1980 when the larger oil producing areas of the Western Hemisphere will most probably begin a period of decline. Security in that period will depend heavily on the degree to which alternate energy sources have been developed in the 1970's. He believes that the financing

of such development will fall largely on the Government. One possibility is to support such developments by receipts from tariff collections.

"Finally, he strongly recommends that the economic and security implications inherent in the proposed program be brought to the attention of our Allies and affected nations at the earliest possible moment, after approval. Prompt and candid actions should mitigate the possible criticism in our changing policy and provide an incentive to others to initiate oil security planning in a different environment from that existing under our current import control policy.

The conditions and qualifications stated by the Secretary of State, the Secretary of the Treasury, and the Secretary of Defense—comprising three-fifths of the so-called majority—make very clear the absence of a Cabinet consensus in support of staff conclusions and recommendations contained in the task force report. On the vital security question, both the Secretary of State and the Secretary of Defense—the Federal officials primarily concerned with security—have strong reservations and have stated them for the record.

Task Force Minority Conclusions

The Secretary of the Interior and the Secretary of Commerce have been joined by the Chairman of the Federal Power Commission in a separate report on the oil import question strongly disagreeing with the recommendation of the so-called task force majority. Four major reasons for their opposition are stated in their report:

1. The program would substitute a tariff for the present quota system. A tariff is highly undesirable in many respects and would lead to domestic and international problems of great significance.

2. The program would result in price fixing. Stripped of its foliage, the recommendation of a tariff of $1.45 is designed to produce a domestic price of $3 a barrel for oil. The control of imports based upon any predetermined price for domestic oil is not only impractical, but would be a further retreat from a free market.

3. The program would risk the national security in fundamental respects. It would make us dependent on insecure foreign supplies by discouraging the exploration and development necessary to build our own reserves of oil and gas. Because of its adverse impact on the natural gas industry the proposed program would disrupt energy resource utilization and consumer demand for 75 percent of our current energy base.

4. The program would involve substantial economic loss to the industry, to its 1.2 million employees and to the 31 oil- and gas-producing States, so as to weaken our internal economy and impair the national security within the meaning of the statute.

These Federal officials, who share major governmental responsibility for government policy affecting oil and gas production in this country have indicated in their report that "a significant reduction in oil and

gas exploration and development" would necessarily follow the actions recommended in the majority report.

More seriously, they conclude that "at a price of $2.50 a barrel the United States would be at the mercy of distant supplying countries within 10 years." The separate report takes issue with majority conclusions on other points of significance. For example, the minority concluded, on page 353 of the report, that:

> (3) The cost to the consumer of present oil import controls is grossly overstated in the task force report.
>
> Two arguments are advanced at this point:
>
> (*a*) If oil import controls were removed, it can be estimated that consumers of natural gas, by reason of decreased exploration and lessened production could pay a large part, if not all, of this amount in increased prices for natural gas.
>
> (*b*) The statement implies that the prices paid for oil products as a result of controls are a total loss to the economy. The fact is that this entire $5 billion, assuming the amount to be correct, goes to the States in production taxes, to royalty holders, to employees, and for equipment and other operating costs that benefit other individuals.

The Secretary of the Interior and the Secretary of Commerce, along with the Federal Power Commission Chairman strongly emphasized the adverse effects on the U.S. economy of the majority proposal and "increasingly adverse" results on our balance of payments from increased imports.

Pointing to 1.2 million employees in the oil industry, the minority predicts a substantial reduction in employment in oil exploration and production, pipeline construction, tanker construction and operation, oil well servicing, pipe production by the steel industry, and allied industries, in the event task force majority recommendations were implemented.

The testimony of a vice president of the Chase Manhattan Bank is also cited in the separate report:

> One of the Nation's leading banks has estimated that between now and 1980 the petroleum industry, under normal conditions, would spend about $70 billion in the United States in search of additional reserves of oil and gas. However, it further concludes that if import controls were relaxed enough to cause the domestic price of crude oil to fall by some 30 cents a barrel, these expenditures would not be more than $20 billion. A reduction of $50 billion in the oil industry's capital spending in the next 11 years would have an adverse effect which would be broadly felt in the national economy.

The conclusion of the Chairman of the Federal Power Commission regarding impact of the majority recommendations on the natural gas and electric utility industries is strongly stated:

> The impact of the proposed tariff-based Oil Import Control program on the domestic petroleum industry will so weaken our national economy as to impair the national security as defined in section 232 of the Trade Expansion Act of 1962. Oil supplies 44 percent of our energy requirements, natural gas

37-143 O - 74 - 5

31 percent, coal 21 percent, and water power, nuclear energy and other fuels 4 percent. Adoption of the "Task Force Plan" will not only disrup the oil and gas industry, but will affect our total energy resource utilization, and consumer demand for 75 percent of our current energy base.

The task force report has virtually ignored the natural gas sector and accordingly, has erred in its conclusion that adoption of the task force tariff-based oil import plan will not adversely affect the national security. Exploration, development and production of natural gas and oil are not practically separable. Twenty-five major oil companies produce 68 percent of the natural gas sold in interstate commerce in the United States. However, the independent oil and gas producers found approximately 80 percent of the new gas and oil fields discovered in 1967 in the interior basins of the United States. In 1968, the regulated pipeline and distribution companies produced only 8.1 percent of the gas transported through their systems. The natural gas industry is dependent almost entirely on the oil companies or independent producers of oil and gas for its basic gas supply. Drastic reduction of oil prices over a term of 3 to 5 years will significantly reduce additions to natural gas reserves, curtail the growth of the natural gas energy sector, and increase consumer costs.

Basically, while conceding the need for revision and some changes to correct problems and inequities resulting from some past policy decisions, the minority of the task force have firmly concluded that the oil import control program is meeting its fundamental objectives.

It has enabled the Nation to draw on foreign oil to supplement domestic supply without becoming dangerously dependent on imports from uncertain sources in time of crises. The much discussed "gas shortage" would be far more critical today but for the operation of the current oil import program.

The separate report contains an alternative plan which provides for an increase in the present import quota formula in four of the geographic districts of the United States by the equivalent of one percentage point in each year for the period of 1970 through 1974.

Other major recommendations include consideration of extension of the unrestricted entry of residual fuel oil to other districts besides district I, negotiation with Canada of a common energy policy, negotiation with Mexico to seek discontinuation of its 30-000-barrel daily quota, phaseout of the refiners crude oil allocations based on historical imports, retention of the sliding scale preference for smaller refineries, increases of imports for petrochemical producers, and a series of other proposals outlined on page 359 of the report.

Major Points Made in Testimony Before the Subcommittee

Nearly every witness testified to the necessity of controls on oil imports as being essential to the national security. Petroleum industry witnesses were in unanimous agreement that the recommendations of the task force majority on oil import controls would not provide

the necessary national security, that their estimates of the supply of oil from domestic and other North American and South American sources were too high, that their estimate of the cost of the program was too high, and that they had made other serious mistakes. A few witnesses made special pleas for specific industries—petrochemicals, coal, and independent fuel oil terminal operators. Following is a summary of the major points made:

NATIONAL SECURITY

Because oil and gas supply three-fourths of U.S. energy, they are essential to the economic health of the country. Everyone including the task force majority on oil import controls recognizes that if the United States becomes dependent on foreign sources for the majority of its petroleum supply, our economy could be brought to a standstill, if that supply were denied for an extended period. Because such a large share of the world's petroleum reserve is in the Middle East, which has cut off oil supplies for short periods before and which appears headed for Russian domination, the possibility that oil supplies from foreign sources could be cut off for an extended period of time is a distinct possibility. Therefore, it is essential that the United States adopt the measures necessary to provide as large a portion of its petroleum supplies as possible from within its own boundaries. The domestic petroleum industry with the right incentives can provide the necessary reserves. However, if imports rise to such an extent that a significant decline in the price of crude oil occurs in the United States, it will discourage domestic explorations and consequently, after a period of years, will make us dependent on foreign sources for the majority of our petroleum supply.

The task force majority analyzed the effects of its proposal only to 1980, but the real impact will not be felt until later. Today the United States has about a 10-year supply of oil reserves at current rates of consumption. Conclusions drawn from study of a period when we are liquidating our inventory cannot be extrapolated to a period when our inventory is gone.

Under the task force majority program, imports by 1985 would supply over 60 percent of U.S. demand, and much manpower and capital previously engaged in exploration and production would be diverted to other purposes. Long before it became evident that the price reduction proposal of the task force majority had created a serious threat to national security irreparable damage to the domestic oil industry would have occurred and at that point little could be done to forestall serious impairment to the Nation's security in an emergency situation.

Pointed disagreement arose concerning the task force majority projections of the 1980 supply and demand situation, particularly those based on the chairman's recommendation. Serious doubt was also expressed regarding existence of the large additional volumes of Western Hemisphere oil to be available to the United States in 1980. Also, the task force majority report anticipates that only 10 percent

of domestic demand would be supplied from the Eastern Hemisphere in 1980; other projections indicate approximately 30 percent, and by 1985 nearly 50 percent. As U.S. dependence on Eastern Hemisphere oil grows, the price of that oil will increase.

The task force majority has included no assessment of the risk of extension of Soviet influence in the Middle East, which would enable them to control and shut off oil to the West at will.

While the task force majority emphasized that national security is of prime consideration, the recommendation of the majority by reducing the price of crude oil by as much as 20 to 25 percent, would drastically reduce the domestic exploratory effort. The subcommittee received a substantial body of testimony from both independent and major producers that if this should happen, their resources would no longer be employed in exploring for oil in the United States.

ESTIMATE OF U.S. SUPPLY AND DEMAND BY THE TASK FORCE ON OIL IMPORT CONTROLS

The Task Force Majority on Oil Import Controls recommended a considerable relaxation of import controls to the extent that the price of crude would decline initially by 30 cents and later by 80 cents. They contend that even with a decline in price of 80 cents, the United States, in the event of a 1-year cutoff of Eastern Hemisphere supplies in 1980 still would be able to meet demand from domestic and other Western Hemisphere sources. They did not, however, look beyond 1980 to the period when the decline in exploration caused by the reduced price would most likely become effective. Therefore, their confidence that these recommendations would not affect national security is incorrect. Their forecast for 1980 moreover is a very questionable one on which to take action, as it could seriously affect our national security, in that they have used the highest probable production figures for each supply source and also assumed the availability of supplies in an emergency such as drawing down inventories which are very unlikely to be available. Any estimate of petroleum supplies for a period 10 years into the future is subject to a significant probable error, but their forecast is even more likely to be in error because they consistently based it on the most optimistic assumptions.

Their forecast for 1980 based on a price reduction of 80 cents per barrel compares with two other forecasts as follows:

[Millions of barrels per day]

	Millions of barrels per day—		
	Task force	Standard Oil Co. (Indiana)	Gulf Oil Corp.
Total U.S. petroleum demand	19.7	21.3	19.7
U.S. production	11.0	9.9	8.8
Available from Canada	3.0	2.5	1.4
Available from Latin America	3.8	2.5	2.1
Total Western Hemisphere supply	17.8	14.9	12.3
Required from Eastern Hemisphere	1.9	6.4	7.4
Additional supplies in an emergency	5.1	----------	0.2
Surplus or shortage in an emergency	3.2	----------	−7.2

All of these estimates are subject to forecasting uncertainties but the possibility of the forecasts made by the two petroleum companies being closer to reality is too great not to recognize the serious possibility that the recommendation of the task force majority would make the United States dependent on imports for up to 55 percent of petroleum supplies and on Eastern Hemisphere sources for up to 38 percent.

The report of the Cabinet Task Force on Oil Import Control recognizes the dangers of becoming overly dependent on Eastern Hemisphere imports and recommends that such imports be limited to 5 percent of U.S. demand. For example, in paragraph 343d the report states as follows:

> Some fluctuations in imports by sources should, of course, be expected as refiners adjust to the new environment, but if state regulators fail to release prorationing or if for any other reason Eastern Hemisphere imports begin to rise significantly, the restrictions on Western Hemisphere imports should be relaxed or abandoned. If estimated Eastern Hemisphere imports for any six months of the transition period would otherwise exceed 5 percent of U.S. demand, these volumetric limits should be expanded so as to keep Eastern Hemisphere imports for the period at 5 percent of U.S. demand.

Again, in paragraph 433b the report states as follows:

> If during the transition period projected imports from the Eastern Hemisphere exceed 5 percent of domestic demand, the volumetric limits on imports from the Western Hemisphere should be expanded proportionately to forestall such excess imports.

In 1969, imports from the Eastern Hemisphere totaled 768,000, barrels daily, as shown on the table below. These imports were equal to 5.4 percent of domestic demand based upon the 1969 average of 14,148,000 barrels per day.

In view of the long history and repeated experiences of interruptions of Eastern Hemisphere imports and the existing international tensions in that part of the world, particularly in the major oil producing countries, the subcommittee recommends that the Congress consider the imposition of a legislative quota on Eastern Hemisphere imports, limiting such imports to approximately the ratio that such imports bore to domestic demand in 1969.

In the interim, the subcommittee urges the Oil Policy Committee to give immediate consideration to the establishment of an administrative limitation on Eastern Hemisphere imports at approximately 5 percent of domestic demand.

U.S. PETROLEUM IMPORTS FROM EASTERN HEMISPHERE, 1969

[Thousand barrels daily]

	Crude oil	Refined products	Total
Middle East:			
Abu Dhabi	14		14
Bahrein		7	7
Iran	42	4	46
Kuwait	34	4	38
Neutral zone	43		43
Qatar	1		1
Saudi Arabia	35	9	44
Total	169	24	193
Africa:			
Algeria	1	1	2
Egypt	40		40
Libya	134	1	135
Gabon		1	1
Ivory Coast		1	1
Nigeria	49		49
Angola	1		1
Total	225	4	229
Others:			
Belgium		11	11
France		9	9
Italy		75	75
Japan		4	4
Netherlands		35	35
Rumania		4	4
Spain		12	12
Sumatra	88		88
U.K		20	20
U.S.S.R		2	2
Total	88	173	261
Indirect imports [1]		85	85
Total Eastern Hemisphere	482	286	768

[1] Estimated imports into the United States of Eastern Hemisphere oil refined in the Virgin Islands, Trinidad, and eastern Canada.

Source: Data obtained from Bureau of Mines and the Department of Commerce.

For purposes of comparison there follows a table showing oil imports from the Western Hemisphere:

U.S. PETROLEUM IMPORTS FROM WESTERN HEMISPHERE 1969

(Thousand barrels daily)

	Crude oil	Refined products	Total
Canada	557	51	608
Venezuela	306	569	875
Total	863	620	1,483
Other:			
Bolivia	15		15
Chile	4		4
Colombia	43	27	70
Mexico		41	41
Peru	1		1
Argentina		1	1
Leeward Isle		1	1
Netherlands Antilles		449	449
Panama		11	11
Puerto Rico		72	72
Trinidad		215	215
Virgin Isles		117	117
Total other	63	934	997
Total Western Hemisphere	926	1,554	[1] 2,480

[1] Includes estimated direct imports of Eastern Hemisphere oil of 85,000 barrels daily from the Virgin Islands, Trinidad and Eastern Canada.

NATURAL GAS SUPPLY

Natural gas provides about 31 percent of the country's energy and heats over half of the housing units in the United States. Of this amount about 35 percent is found in association with oil. The natural gas industry would be adversely affected by the recommendations of the task force majority on oil import controls. The decline in the search for oil would reduce the gas found in association with oil, as well as nonassociated gas discoveries. To bring about an increase in the search for natural gas to offset the decline due to the proposal of the task force majority would require a very substantial increase in the price of natural gas. According to the Chairman of the Federal Power Commission, if we assume an elasticity for gas at one-half the rate included in the computations of the task force majority, and other realistic conditions suggested by the Chairman, this increase would be from 8.8 cents to 17.6 cents per Mc.f. This means an additional cost to consumers of from $1.8 billion to $3.5 billion. This increase in the price of natural gas would largely offset the projected savings estimated by the majority recommendations under the tariff proposal.

THE COST OF THE OIL IMPORT CONTROL PROGRAM

The task force majority on oil import controls estimates that the cost to the consumer of the present system of oil import controls is $4.848 billion. This has been rounded to $5 billion and has been widely quoted. There have been numerous estimates of the cost to the consumer. The estimate by the Office of Oil and Gas of the Department of the Interior estimated it to be $2.2 billion in 1975 and something less now. However, any cost to the consumer is offset by other benefits to the economy such as tax and bonus payments to Federal, State, and local governments, wages paid to employees, et cetera. Estimates of these offsetting benefits are as high as $4.6 billion. Therefore, even if the cost to the consumer estimate is correct, it is offset by other benefits to the economy. On balance, removal of import controls could well result in a net cost to the public.

It should be noted that the $5 billion cost of the import program cited by the task force majority is not the saving under their proposal which still restricts imports. Their proposal would take most of the savings on imports in the form of higher tariffs and would make higher oil and gas prices a certainty.

TARIFFS AS A METHOD OF CONTROLLING IMPORTS

The task force majority recommends that the present system of quotas for controlling imports be replaced by a tariff system. A tariff system applied equally to all nations, as has been the longstanding policy of the United States, would immediately shut off imports from Canada and Latin America—areas of the world considered most secure. Consequently, the task force majority has recommended a system of preferential tariffs with no additional tariff for Canada and Mexico and an increase of $1.35 per barrel for Eastern Hemisphere and $1.15 per barrel for Latin America. Although this appears to be a very questionable action with regard to our foreign relations as it seems to

penalize friendly foreign countries just because they are located in the Eastern Hemisphere, it is not the responsibility of this subcommittee to pass judgment on this aspect.

Regardless of the preference feature, however, it would be difficult to achieve a desired level of imports with a tariff because the effect of any given level of tariff upon imports cannot be known beforehand. As a result, a tariff program would result in a process of constant trial and error in seeking a proper tariff, and effective administration of the program would be impossible.

Even if a level of tariffs could be found that would give the desired level of imports, the tariff would have to be changed frequently. Recent changes in tanker rates suggest the magnitude of changes in tariff levels that would be necessary every time tanker rates changed, and they change by significant amounts frequently. The task force majority recognized that tariffs might not provide the restrictions necessary so they recommend a maximum level of imports from the Eastern Hemisphere equal to 10 percent of demand and propose that import licenses for this volume be auctioned, with importers paying the tariff as well as their purchase cost in the auction. It seems most likely that the maximum would rule and thus the task force majority has recommended a quota system together with a tariff which becomes a tariff for revenue. This system would also favor those companies with the cheapest foreign source of crude and would tend toward concentration in the industry among a few large companies.

DETRIMENTAL EFFECTS

The most immediate effect of the task force majority recommendations would fall on the small business operator, the small producer, the small refiner, and the stripper well operator. These operators would be forced out of business. Besides the loss of jobs and opportunity that would result, the oil that these stripper wells and marginal operators now produce would be lost. This is not good conservation. At the end of 1968 the stripper wells, producing less than 10 barrels each per day, had reserves estimated at 5.5 billion barrels. This amount of oil would most certainly be lost immediately. Also, costly secondary recovery of oil would become less attractive and would add additional losses. Exploration by the small independent operator would be curtailed and the major operators would confine their exploration only to the most accessible and low-cost areas. It is very questionable if the present North Slope development in Alaska would have taken place had the proposed tariff system been in force 6 to 8 years ago when interest first started in that area.

BALANCE OF PAYMENTS

The additional imports that would be permitted under the task force majority recommendation would undoubtedly substantially increase this Nation's adverse balance of payments. The subcommittee received testimony that the net additional outflow of funds would amount to $300 million in 1970, $700 million in 1973, and $2.2 billion in 1978. Substantial increases in the use of foreign crude supplies by

1980 and beyond would increase the adverse balance of payments beyond the $2.2 billion projected for 1978. In all fairness to the majority position it should be pointed out that the adverse balance-of-payments problem is proportional to the amount of oil imported whether it be under a quota plan or controlled by a tariff. However, as the tariff proposal is designed to lower the price of crude and permit substantially larger amounts of foreign oil to enter the United States, the adverse balance of payments would be proportionately greater under the tariff proposal.

The task force majority has stated the Nation may become dependent on imports for 50 percent of our petroleum requirements by 1980 under its recommendation. Some additional estimates may be helpful as to the magnitude of the cash outflow involved. Estimates of U.S. oil requirements show that by 1980 this Nation will be consuming some 20 million barrels daily. If half of this requirement is supplied by imports and assuming there is no increase in the cost of imports above the current price of about $2 per barrel, the resulting outflow of dollars would be approximately $9.5 billion annually. This is based upon Department of Commerce reports which show that the outflow for each barrel of oil, including freight and insurance, averages about $2.65 per barrel. Furthermore, if the Nation should adopt a policy of becoming 50-percent dependent on oil imports in 1980, the impact on natural gas exploration and development would be drastic with the result that we would also have to rely heavily upon imports of natural gas. If we become dependent on imports for 50 percent of our oil requirements, it is logical to assume that we likewise, in the long run, would become dependent upon imports for some 50 percent of our gas requirements. FPC Chairman John N. Nassikas, in his dissenting views in the Cabinet Task Force report, estimates the cost of liquefied natural gas (LNG) at the eastern seaboard at 60 cents per thousand cubic feet. Every indication is that this is conservative and that the cost actually might be substantially higher perhaps rising to $1 or more, depending on how far inland the LNG might be used. But, using his estimate of 60 cents per thousand cubic feet and assuming that our natural gas requirements which are now some 20 trillion annually will increase to 30 trillion by 1980 the dollar outflow for 50 percent of this requirement would be an additional $9 billion annually.

Thus, the dollar outflow by 1980 for both oil and natural gas imports could be in the order of $18 billion annually. By 1985, in view of rapidly growing requirements, the outflow would be substantially greater. It seems to the subcommittee that this analysis indicates that the impact on the cash outflow could be absolutely intolerable a few years hence if we should adopt a policy of increasing dependency on foreign sources for our oil and natural gas needs.

THE NEED FOR STABILITY TO ATTRACT INVESTMENT CAPITAL

The Nation's economic system is based not only on actual profit and loss, but on expectation that a profit can be realized and loss can be avoided. Tax incentives for oil exploration were reduced by Congress in 1969 and now the very existence of the task force report, with its majority recommendations for reducing the domestic price of oil, introduces a new element of uncertainty into an already uncertain business.

Money is spent today for exploration and development in the hope of finding oil that can be sold profitably under conditions existing not in 1970, but in the decade 1975–85.

CAPITAL REQUIREMENTS

It has been estimated that the United States will consume daily nearly 15 million barrels of oil and 58 billion cubic feet of gas during 1970. By 1985 this will have increased to about 22 million barrels of oil and 90 billion cubic feet of gas or an increase of about 50 percent. Based upon testimony of John G. Winger, vice president of the Chase Manhattan Bank, the domestic petroleum industry will need to develop a total of about 105 billion barrels of oil and 560 trillion cubic feet of gas between now and 1985 if this Nation is to maintain a minimum safe inventory of proved petroleum reserves without becoming more dependent on foreign sources of supply. To find such amounts of petroleum will require an expenditure of $150 billion. As the total outlay during the past 15 years has been about $68 billion, the capital outlay must be doubled or tripled in the next 15 years to stay even with the increased amount. Unless the rate of expenditure is increased that goal will not be reached. If the present rate of expenditure holds until 1985 the total outlay devoted to the search for more petroleum will amount to $75 billion. It follows that any decrease in the domestic price of crude will certainly not act as an incentive for the required and necessary increased expenditures. As there has been a constant relationship, for the last 15 years, between funds spent on exploration and proven reserves, there appears little reason to expect this relationship to change. A decrease in exploration means a decrease in petroleum reserves.

It neither seems likely nor logical to expect that the petroleum industry could increase exploration in the face of declining petroleum prices. The alternative is a decrease in proven reserves and a greater dependency on foreign supplies.

PRORATIONING

The task force majority suggested that their recommended program would eliminate State prorationing and implied that market demand prorationing was an evil and a price-setting mechanism. The testimony of several witnesses from State agencies showed that price control is not an objective of market demand prorationing and that it is necessary as a conservation measure. They reviewed the chaotic conditions prevalent in the days of unregulated production which was characterized by waste and sharply fluctuating prices. Evidence was presented to show that in constant 1958 dollars during the 40 years prior to prorationing, the average price of crude, despite the wide fluctuations, was $2.88 a barrel. In the 25 years under prorationing and before import controls the average price was $2.77, and in the 11 years of both prorationing and import controls the average price was $2.39.

There was also indication by the task force majority that the elimination of prorationing would increase production and bring into play much of the shut-in capacity of many of the wells in the southern and gulf coastal areas. The testimony received by the subcommittee brings into question the availability of much of this estimated shut-in capac-

ity. Although this shut-in capacity has been estimated to be of a substantial amount, efforts to increase production significantly during emergency periods of the past few years indicate this may be much less than originally anticipated both as to daily amounts and duration of production. Undue reliance on this projected shut-in capacity would be unwise without further detailed investigation.

SPECIAL PROBLEMS

There are two problem areas of special significance which this subcommittee feels should be noted. They are:

Coal.—The Government's policy on imports of residual fuel oil needs to be reexamined and reevaluated. The pressures which have been building in recent months to open district II–IV to imported residual fuel oil adds a sense of urgency to the policy review.

Experience in district I (the east coast) shows clearly what can be expected to result once imported residual oil gains access to U.S. markets. Imports into district I in 1969 totaled almost 450 million barrels. Almost 85 percent of all residual consumed in the area originates overseas. This is an increase of about 125 million barrels over imports in 1966, the year in which all controls were essentially removed.

This significant increase in imports raises a number of serious questions involving national security. Secretary of Defense, Melvin H. Laird, reflected the misgivings of this subcommittee about current residual oil import policy in his presentation to the Cabinet Task Force on Oil Import Control. The report of the task force, in summarizing Secretary Laird's position, states:

> He also considers that the question of residual fuel oil has not been adequately analyzed and believes that the effects of virtually free access to foreign residual oil on U.S. markets and U.S. refining capabilities have been such as to make the continued exemption of residual oil from import controls open to question. He strongly urges that the entire subject of residual oil be studied as quickly as possible.

One development which demands considerably more attention than it has received has been the rapid conversion of the east coast electric generation system to burn imported residual fuel oil. Even if the imported oil should continue to originate in Venezuela and other Caribbean areas, as it has primarily in recent years, there would still be cause of grave concern over the security of supply in times of emergency. But in recent months there has been an alarming shift in the source of supply from the Caribbean to North Africa and Middle East oil producing areas. Even the most enthusiastic supporters of a liberalized oil import program must admit that these areas are the most insecure source of supply and, therefore, the most readily subject to interruption.

This subcommittee does not believe, nor does it recommend, that residual oil imports into the east coast should be cut off or rolled back. In the first place, it is doubtful that domestic fuels in sufficient quantity would be available to replace them. Secondly, such a move would cause economic chaos until alternate fuel supplies are developed. But the subcommittee believes that a start must be made at checking and

eventually reversing the trend which, if it continues unchecked, will make the entire industrial complex in the vitally important east coast area wholly dependent upon a foreign fuel for its uninterrupted operation. This can be achieved by using present import levels as a base and then permitting imported oil to share in the growth in fuel consumption in the area in future years. In this manner, there will be re-established an incentive for domestic fuels industries, and particularly coal, to develop the productive capacity to serve the area.

The proposed imports of residual oil into the interior of the Nation, via the Mississippi River, are predicated upon the need for more low-sulphur fuel to meet air pollution control requirements. The cost of low-sulphur fuel is high in relation to domestic fuels, as much as 50 percent greater in some cases. The subcommittee fears that if a policy of permitting fuel consumers to meet their low-sulphur fuel requirements through imports is followed, serious problems, aside from national security, will be raised for the Nation. In the first place, much of the incentive to develop technically and economically feasible methods for controlling pollution from burning high-sulphur domestic fuels will be destroyed. This subcommittee feels that a major effort must be made by this Nation to redeem high-sulphur coal for the market and to further develop and use the vast amount of low-sulphur coal in the Western States. But to give assurance to electric utilities and other major users of fuel that they can meet air pollution regulations by importing fuel into an area which heretofore has been immune to imports is not a sound way to approach this national commitment. The subcommittee fully recognizes the need to control pollution but feels that there are acceptable alternatives other than the importation of foreign fuel oil.

Permitting unlimited imports of low-sulphur oil would add significantly to our balance-of-payment problems. In 1969, this Nation had to expend $860 million to pay for the residual oil it imported. Perhaps Some Government economists are now attempting to downgrade the in this country, payment of dividends and repatriation of profits. But the fact remains imported oil contributes substantially to our continuing balance-of-payments deficit and a policy of unlimited residual oil imports into the Midwestern States would add to the deficit.

Some Government economists are now attempting to downgrade the economic importance of the balance-of-payments deficits. This subcommittee cannot accept this approach to a difficult problem and we urge that every feasible measure be taken to reduce or eliminate the payments deficits. A changed policy on residual oil imports should be a major factor in achieving this end.

The subcommittee urges that imports of residual oil into Districts II–IV continue to be subject to controls, with special allocations granted only in the most unusual of cases and with a clear understanding that development of the pollution control technology must take precedence over imported fuel as a means of meeting the Nation's goal of clearing up the air.

Petrochemicals.—The cost of domestic crude is higher in the United States than imported foreign supplies. Consequently, the petroleum raw materials (feedstocks) employed by the domestic petrochemical industry in the production of chemicals and plastics are more costly here than in Europe or Japan. This cost difference places domestic

petrochemical producers at a disadvantage with some overseas producers using the cheaper feedstocks and may threaten to impair the $1.3 billion a year contribution which petrochemical exports make to the balance of trade. The cost differential also provides an unfortunate incentive to locate petrochemical plants abroad rather than in the United States.

These contentions were spelled out in some detail in the submissions filed with this subcommittee.

Both the task force majority report and the separate report of Secretaries Hickel and Stans agreed that the supply of feedstocks to the petrochemical industry should be improved. The separate report specifically recommends that petrochemical producers be provided with a growing volume of imported oil.

The subcommittee is aware of the problems of this industry and recognizes that for it to remain fully competitive in world trade some improvement in supply of feedstocks and their cost may be required. The subcommittee, while recognizing these industry problems is even more aware of the dangers of dependence of this industry upon distant foreign sources and emphasizes the need to work out a solution to the industry's problems that takes into account the need for a healthy domestic petroleum industry.

The Present Mandatory Oil Import Program

During its deliberations in connection with the 1968 hearings this subcommittee found that the present mandatory oil import program had been successful except for certain administrative weaknesses and inequities. Our more recent hearings reinforce this conclusion. Almost all witnesses appearing before the subcommittee testified as to the necessity for a continuation of the import program for the national security of this Nation. There was also widespread agreement that the present import program has been successful in its basic objective and needs only to eliminate certain special benefits built into the program after its inception. The subcommittee feels that it is highly significant that, on the basis of testimony received, it must be concluded that from the 1957–59 period up to 1969 crude petroleum prices increased only 2.1 percent compared to a 12.7 percent increase for all wholesale prices. During the same period consumer prices increased 27.7 percent but retail gasoline prices were up only 10.5 percent and heating oil higher by only 15.2 percent.

It appears to the subcommittee that few, if any, other major industries have done as well in holding the line on price increases as has the petroleum and natural gas industry.

Committee Findings

The following points summarize the findings of the Subcommittee on Mines and Mining with regard to the hearings held on the matter of oil imports and the proposals of the Cabinet Task Force on Oil Imports:

1. The national security of the United States, is, and must remain the overriding objective of any oil import program. Both the task force majority, the separate views by Secretaries Hickel and Stans, and Chairman John N. Nassikas of the Federal Power

Commission, as well as witnesses appearing before the subcommittee, agreed on this as the basic objective. There was also basic agreement that some form of import restriction, whether it is a tariff or a quota, is necessary to prevent undue reliance upon insecure foreign oil.

This subcommittee reaffirms its position that it is necessary to control the inflow of foreign crude and unfinished oils in order to maintain a strong and healthy domestic petroleum industry for the protection of this Nation in time of emergency.

2. Imports of crude oil and refined products now make up a very substantial portion of this Nation's petroleum requirements. Imports now average approximately one-third of domestic production and one-fifth of domestic demand. In the opinion of this subcommittee any significant increase in the import must be avoided as they have already reached dangerous proportions.

3. Any future estimates of petroleum supply or demand are subject to the uncertainties of forecasting. However, the task force majority report appears to be unrealistically optimistic on the development of as yet undiscovered reserves in the Western Hemisphere and, accordingly, that available from these sources. At the same time it has underestimated the probable need for Eastern Hemisphere oil and the degree of dependency on this insecure source under the majority's recommended program.

4. Supplies of natural gas are already critical and unless immediate relief is provided the shortage will undoubtedly increase. Any decrease in the price of domestic crude, brought about by increased imports, will further discourage the search for both petroleum and natural gas.

5. The estimated cost of the present control program, as compared to no controls, has been greatly overstated. Rather than the $5 billion annual cost suggested by the task force, a more realistic figure probably is less than $1 billion. When full consideration is given to intangibles and to the very real probability of higher foreign crude prices once this Nation's dependency on foreign sources is well established, there actually may be a net benefit to the economy from the present import program.

6. The immediate effect of the proposed tariff proposal would fall hardest on the small operator. The small producer, the small refiner, and the stripper well operator would be forced out of business.

7. The 5.5 billion barrels of oil now estimated as reserves in stripper wells would be immediately lost. Such a loss cannot be recovered later. This is not proper conservation of a valuable and nonrenewable natural resource. Costly secondary recovery of oil from marginal and partially depleted fields would also be discouraged.

8. Adoption of the task force majority proposal would have an immediate adverse effect on this Nation's balance of payments. This has been estimated at not less than $2.2 billion per year.

9. The subcommittee recognizes imperfection and inequities in the existing mandatory oil import program. It believes, however, that these are faults of administration rather than deficiencies in the program as conceived.

10. During the past 15 years the petroleum industry has spent about $68 billion searching for oil and gas. Much larger amounts of capital will be needed in the future. Any decline in the price of domestic crude will not provide the necessary incentive for increased exploration. Less exploration will result in less oil found. However, if proper incentives for exploration and development are provided this Nation has the potential of remaining substantially self-sufficient in the energy field. The vast potential energy reserves in coal and oil shale have not been developed. Our oil shale reserves (estimated at 2 trillion barrels) exceed the petroleum reserves of the Middle East and coal reserves are estimated to exceed 1,000 years supply. Estimated undiscovered oil in the United States is placed at 2 trillion barrels and natural gas at 1,200 trillion cubic feet.

While some small percentage increase in imports may be expected in the normal course of events, this subcommittee must conclude that this is not a nation lacking in energy supplies. The real question is our desire and ability to develop and use the resources available.

11. Prorationing, as practiced by the several States, is a necessary conservation practice to assure maximum economic recovery from a field. Elimination of prorationing as suggested by the task force majority may result in a temporary increase, but would result in an overall loss of production.

12. The task force majority places more confidence and reliance on the estimated shut-in capacity than is justified. Although there is undoubtedly some shut-in capacity in the United States, the subcommittee believes it to be substantially less than that estimated by the majority report. Undue reliance on this source for future supplies may prove unwise.

13. The displacement of coal by oil is of special concern to the subcommittee. The east coast now relies largely upon imported residual fuel oil. The subcommittee does not believe that the amount of residual oil imported is likely to be cut back but it does believe that immediate attention must be given to working out a formula under which imports would be permitted to increase at a rate which would be consistent with the increase in the overall demand for competitive fuels on the east coast. In this way imported residual fuel oil would be permitted to share in, but not dominate, the east coast growth market for industrial fuels.

In reaching this conclusion, the committee took note of the published concern of the Secretary of Defense over the effects of east coast dependence on foreign fuel, as well as the fact that a shift toward North Africa, an unstable area of the world, as a source for imported residual is now beginning to develop.

14. The subcommittee recognizes the problems of the petrochemical industry and its need for adequate low-cost feedstocks. This was also recognized by both the majority and the separate reports of the task force. If this industry is to retain a competitive position in the world market it will require an improvement in the present feedstock situation, which should be accomplished without increased reliance on distant sources and without penalizing domestic industry, if possible. An in-depth study of this matter is urgently needed.

15. Research should be continued and intensified for the use and development of synthetic fuels. The vast oil shale and coal deposits of this Nation cannot be ignored as they make up the greatest potential source of fossil fuel energy in this country.

This subcommittee reaffirms its position that intensified research and development, both by the Federal Government and private industry, are necessary in the synthetic fuels field. Any cutback in Government research funds in this area at this time could force this Nation into a position of dependency upon unreliable sources of foreign crude.

16. The increasingly omnibus situation in the Middle East is of grave concern to this subcommittee and any increased reliance upon this geographic area as a source of oil appears to be less than prudent. In this respect the reservations expressed by the Secretary of Defense are well taken. The subcommittee fully agrees with Secretary Laird that the tone of the majority report infers a capability of reacting to an oil emergency that is overly optimistic. The subcommittee also fully agrees with his observations that the residual fuel oil question has not been adequately analyzed and that it must be given further consideration. And last, but of utmost importance, the subcommittee fully concurs with the Secretary's views that domestic exploration must be maintained at approximately current rates and that no reduction in reserves be allowed. The subcommittee, while agreeing with the Secretary on these and most other reservations he expresssed, differs in that it is of the strong opnion that adoption of the majority task force recommendations will prevent the realization of these national security objectives. In view of the very grave storm signals coming from the Middle East this subcommittee cannot stress enough the danger in further reliance upon oil from this area. The subcommittee feels it would be remiss if it did not stress the national security aspect of this problem and strongly advises that top level consideration be given to any additional dependency upon oil from these troubled and unreliable sources.

SEPARATE VIEWS OF MR. O'HARA AND MR. CAREY ON THE REPORT BY THE SUBCOMMITTEE ON MINES AND MINING: THE OIL IMPORT QUESTION

Background of the Mandatory Oil Import Control Program

Any evaluation of the present import control program requires some knowledge of the circumstances under which it was established. For decades before and during World War II, world oil prices were linked closely to the U.S. gulf coast price. With the development of market demand prorationing—limiting production to whatever percentage of the maximum efficient recovery rate necessary to protect the price structure—by the principal oil-producing States, U.S. prices could be raised with the secure knowledge that the world price level would follow. This link was broken through a variety of factors during the 1950's.

The 1956 Suez crisis provided an excuse for producers to raise U.S. crude prices by 25 cents per barrel (40 cents per barrel for gulf coast crudes) in February 1957, with Venezuelan prices following. Mideastern prices went up by only half this amount, however, and even these prices could not be maintained. As Mideastern prices eroded in 1957 and 1958, matched by heavy discounting of Venezuelan prices, foreign oil began to move into the U.S. market in quantities sufficient to threaten the U.S. price level. The domestic oil industry used its powerful political influence, aided by the coal industry, to persuade the Federal Government to limit this flow. A voluntary restriction program was inaugurated in July 1957. When voluntary restrictions proved ineffective, the President instituted the mandatory import control program on March 11, 1959.

The stated purpose of the controls is to maintain a prosperous domestic industry in the interest of national security. There can be, and is, sharp disagreement on whether the program is essential for national security. There can be no disagreement about the fact that its practical function is to insulate U.S. crude oil prices from the decline in foreign prices, to implement State market demand prorationing, and to preserve a level of crude prices substantially higher than would be possible in the absence of controls.

COST TO CONSUMERS

The success of the mandatory oil import control program in insulating U.S. crude oil prices from the world market has been achieved at tremendous cost to the consuming public. Because of the program consumers pay higher prices for gasoline, heating oil, public transportation, electricity, and most things they buy than they would in the absence of controls. Mr. John Lichtblau, director of the Petroleum Industry Research Foundation, found that in 1968, excluding taxes, Montreal consumers paid 3 cents per gallon less for gasoline and 4

37-143 O - 74 - 6

cents per gallon less for home heating oil than did New England consumers; the difference is that the Montreal products are refined from imported oil, delivered to Portland, Maine, and moved across New England via a pipeline to Canada.[1] At the end of July 1970, the New York Harbor price for bulk regular gasoline was 13.3 cents per gallon; at Rotterdam (very nearly the same distance from the Persian Gulf, via the Cape of Good Hope, as New York), the bulk price for 91/92 octane gasoline was 6.2 cents per gallon, less than half the New York price.[2] These examples give some indication of the effect of import controls on prices.

The Cabinet Task Force estimated that in 1969 consumers could have saved nearly $5 billion had controls been eliminated at the end of the previous year; the Office of Emergency Preparedness estimate was $5.3 billion. By 1980, according to the task force staff, the cost to consumers will be $8.4 billion a year. This long-run estimate is in general agreement with one submitted by the very competent economic research staff of Standard Oil Co. of New Jersey. Jersey Standard's estimate is for a cost of $7 billion annually, assuming a price increase of 50 cents per barrel for foreign oil; under an alternative assumption of stable long-run prices (anticipated by most independent economists), the Jersey Standard estimate comes to $10.2 billion a year by 1980.

In more immediate terms, the task force estimated the 1969 cost to consumers throughout the country at $24 a year, or $120 for a typical family of five. This is, in a very real sense, nothing more than a special tax levied on the general public for the exclusive benefit of the oil industry. We are unimpressed by the majority view in this report and the minority argument in the task force report that the cost to consumers is not a cost to the economy, since the loss to consumers is offset by benefits in the forms of dividends to oil company stockholders, wages to industry employees, royalty payments, or State oil taxes. We look instead at the fact that 200 million people are being taxed through inflated prices for the benefit of a select, small segment of the population; and that the citizens of 50 States are expected, through the import control program, to subsidize the governments of, say, five States which produce most of our crude oil.

We agree with the subcommittee majority that the vague and ambiguous tariff proposal of the task force would prevent consumers from realizing more than a fraction of the potential savings through abandoning the present program. U.S. crude prices would still be protected indefinitely at a level well above the world price, although somewhat lower than current prices. About the most which can be said for the tariff proposal is that the economic windfall now enjoyed by refiners would be channeled into the Federal Treasury. We would prefer a policy which would insure that the fullest possible savings be passed on to the consuming public.

EMPLOYMENT EFFECTS OF INCREASING IMPORTS

The majority view, in a striking piece of hyperbole, suggests that increased imports would threaten the jobs of 1.2 million workers in the oil business. There is no explanation that most of these workers are

[1] "Oil & Gas Journal," Mar. 3, 1969, p. 78.
[2] "Platt's Oilgram" Price Service, July 28, 1970.

employed in the refining, distribution, wholesale and retail marketing segments of the industry, jobs which would be completely unaffected by an increase in crude oil imports. To the extent that any employment effects were felt, it would be among oil and natural gas field workers (total employment of 145,000 in 1969, according to the Department of Labor) and oil and gas field service workers (134,000 in 1969).

It may be noted that the 1969 total of 279,000 employees was substantially less than the 330,000 reported for 1959, the first year of the mandatory program. This can hardly be blamed on imports, since domestic production of crude oil and natural gas liquids rose by 36 percent and natural gas by 67 percent over the decade. The loss of 5,000 jobs a year through productivity increases has not apparently caused any problem either to the industry or to the economy. Nor is it likely that a relaxation of controls would displace workers at a rate which would hinder their ready absorption into other areas of the economy.

We are not at all convinced that unemployment is a necessary result of the relaxation of controls. Even a sharp reduction in wellhead price would have little effect on production from existing fields; indeed, such production might increase with a concomitant relaxation of State controls which would permit wells to be operated at their most efficient rates of output. It is possible, but by no means certain, that a decline in wellhead price would reduce employment in exploration activity. This could be prevented, however, by the development of policies which would encourage exploration more successfully and at lower cost to consumers than the present import control program.

RESIDUAL FUEL OIL

The majority of this subcommittee views with alarm any proposals that imported low-sulfur residual fuel be permitted into the Midwest. Such a position ignores the critical energy requirements of utility and industrial consumers in this area, as well as the right of citizens to reduce air pollution as rapidly as possible.

In view of the price advantages of gasoline and distillate fuels, domestic refiners east of the Rocky Mountains endeavor to minimize the production of residual oil; advances in refining technology had reduced the yield of residual oil to only 5 percent of refinery output in districts I–IV by 1968; domestic residual production in that year was little more than one-third of industrial consumption.

The inability of domestic refiners to supply residual fuel led the Government to eliminate import restrictions in district I in 1966. Today the industrial expansion of the Midwest is threatened by shortages of fuel capable of meeting new antipollution requirements. The majority would have us delay a solution to this problem—and delay industrial development in the Midwest—until the technology of eliminating pollution from coal-burning plants has been perfected.

We cannot agree to such a policy. Restrictions on the importation of residual fuel oil into districts II–IV should be eliminated immediately. The majority points out that low-sulfur fuel is expensive; this in itself should provide an economic incentive to coal producers and users, with Government assistance if necessary, to eliminate air pollution from

coal furnaces. Certainly, a strong effort should be made in this direction, but the mandatory oil import program is not the proper vehicle for such an effort.

Experience in limited foreign wars suggests that the availability of oil is not likely to be a problem. According to the Department of Defense, 90 percent of our military and naval requirements for the Vietnamese conflict has been met from foreign sources—65 percent from the Persian Gulf and 25 percent from Caribbean and Southeast Asian suppliers.[3] DOD reports in the same source that some 440,000 barrels per day of the total U.S. defense requirement of 1.1 million barrels per day is secured from foreign sources; this amount is less than 4 percent of domestic output and well within the production capacity of the United States.

So far as military requirements are concerned, the Department concludes that, "In the foreseeable future, partial or complete denial of foreign oil to this Nation would not, in any important degree, limit our capability for military action and/or negotiations."[4] The Department points out, it is true, that supply interruptions could pose a much more serious threat to our allies in Western Europe and Japan, who are almost completely dependent upon imported oil. We are not convinced, however, that the mandatory oil import control program provides an acceptable or a satisfactory solution to this problem, consistent with the cost to American consumers.

NATIONAL SECURITY AND FOREIGN OIL SOURCES

National security is the comprehensive argument advanced by the domestic oil industry and its supporters in Government to justify the oil import control program. It is presumed that the necessity to be as self-sufficient as possible in hydrocarbon energy sources requires the United States to maintain crude oil prices which are at least double the world price level. Evaluation of the import control program as a security measure calls for some definition of the problem. There appear to be three contingencies in which security need be considered: general war, limited foreign war, and political interruptions to crude oil supplies.

Little need be said with respect to general war. It would be unrealistic in the extreme to suppose that such a war, involving the United States and other developed nations, would be a protracted "conventional" replay of World Wars I or II; rather, it would be nuclear conflagration of short duration leaving unimaginable destruction of lives and property in its wake. No military authority believes that crude oil supplies would be a problem in nuclear war. The principal question would be whether the Nation would survive with sufficient refining and transportation capacity to use the crude it possesses.

The third contingency, political interruptions to supply, appears on its surface to offer the most serious threat to security. Proponents of import controls advance the following argument: Should the United States become dependent upon foreign oil to any significant degree, we would be at the mercy of politically inspired boycotts of such oil—not

[3] "Department of Defense Submission to the Cabinet Task Force on Oil Import Control," submission No. 94, p. 2.
[4] Ibid., p. 4.

in the military sense, but in terms of energy supplies vital to the functioning of our economy. We agree that the political risks with any particular foreign source are greater than the risks associated with domestic production. This means that there may be occasional temporary dislocations of established supply lines (such as the one we see in the summer of 1970), dislocations which are inconvenient but which can hardly be classed as emergencies. We believe, however, that fears of widespread, general shortages of foreign supply have been grossly exaggerated by those who profit from existing import controls.

Such fears ignore the simple fact that oil provides the principal source of income to most oil-exporting countries. Their need to market oil is far greater than the needs of the United States or any other oil-importing country to buy oil from a single source. For this reason attempts to pressure consuming nations by withholding oil have a history of failure. In the most serious example of this, the 3-year total shutdown of Iranian fields in 1951–54 (actually a boycott by the international oil companies against the Iranian Government), the elimination of Iranian supply was rapidly offset by an expansion of Saudi Arabian production. More recently, the attempt by certain Arab nations to boycott the United States and several of its allies, following the 1967 Arab-Israeli crisis, failed because its effect on consuming countries was negligible compared to its cost to the producing nations.

Excluding the United States and the U.S.S.R., foreign production of crude oil rose by 150 percent between 1959 and 1968, from 3.4 billion to 8.5 billion barrels a year. Among the countries which produced this oil, only three had production in excess of a million barrels a day in 1959; by 1968 there were 7 million-barrel-a-day suppliers. Each year new foreign sources of supply appear as factors in the world market. This in itself minimizes the degree of risk from political interruptions to the world oil supply. We suggest that participation by U.S. oil companies and by the United States as an oil customer in developing these alternative sources is a viable alternative to the import control program to protect our national security.

THE POLITICAL FUTURE OF THE MIDEAST

The majority view expresses great concern over the possibility that the oil-producing nations of the Mideast will come under Soviet domination. Indeed, there is no question but that Soviet influence in the area today is far greater than it was in 1959. That this is so can be traced directly to this country's oil import control program. The exceptions which have grown up to riddle the existing program are designed to favor Western Hemisphere oil; the tariff proposals of the task force would go even farther in discriminating against Eastern Hemisphere crude. We are in the anomalous position of telling the mideastern nations, "We won't take your oil, but we don't want you to sell it to the Iron Curtain countries either."

Considering the importance of oil to their economies, it is not surprising that the mideastern countries view our posture as a deliberate affront. In their part of the world, U.S. oil policy is U.S. foreign policy. Oil import policy as it exists today, and as the majority would have it continue in the future, could not be better designed to force the Mideast into the Soviet sphere. Our only hope of retaining any influence in the Mideast lies in an immediate relaxation of import controls

on a nondiscriminatory basis which will allow Eastern Hemisphere oil to compete in the U.S. import market with that from the Western Hemisphere as freely as the economics of production and transportation permit.

HAWAII

The case of Hawaii affords an especially striking example of the inequities which have developed under the import control program. For purposes of the program, Hawaii is considered part of district V, despite the fact that 2,500 miles of open ocean separates the State from the west coast. This treatment contributes absolutely nothing to national security. In the event of international conflict involving submarine warfare, Hawaii would be isolated from the west coast as effectively as from the Persian Gulf. Nor do the controls applied to Hawaii provide a market for domestic production, since the one refinery in the State has always operated almost exclusively with Persian Gulf and Indonesian oil.

The effect of import controls in Hawaii has been to preserve a monopoly over the supply of petroleum products by the single refinery in the State, operated by a major oil company and supplying four other major oil marketers and two small distributors. Although the refinery runs on inexpensive foreign oil (laid down in Hawaii at $2 to $2.25 a barrel), the output is priced as if it came from west coast crude transported to Hawaii at U.S.-flag shipping rates, a theoretical cost basis roughly double the actual cost of crude to the refinery.

As a result, Hawaiian consumers pay much higher prices, excluding taxes, for gasoline than west coast consumers. Paving asphalt is priced 75 to 90 percent above the west coast price. Bunker C fuel normally costs more in Honolulu than in any other port in the world except Capetown, so that shipping avoids bunkering in Hawaii whenever possible. Again we repeat that there are no offsetting benefits in terms of national security or stimulation of domestic production to these excessive consumer costs. We therefore urge an immediate exemption from import controls for the State of Hawaii.

While committee procedures do not permit members of the full committee who are not members of the subcommittee to join in signing these views, several members of the full committee have indicated their agreement with the content of this statement. They are Mr. Ryan, Mr. Meeds and Mrs. Mink, who is particularly interested in the section pertaining to oil import control inequities affecting her State of Hawaii.

JAMES G. O'HARA.
HUGH L. CAREY.

SUPPLEMENTAL VIEWS TO THE MAJORITY REPORT ON OIL IMPORT-TARIFF HEARINGS

The majority report and views in conclusion provide a useful updating of the long studied oil import program. As to the conclusions reached from the study of the President's task force finding and the testimony, the undersigned differ from the views of the majority in several specific areas.

The majority report either omits or understates in detail the effect on consumers of a continuing overly restrictive import policy. This policy which restricts imports to 12 percent of domestic production at a time of burgeoning energy and fuel demands works a hardship in the consumer energy demand areas such as the eastern seaboard of the United States. This calls for comment as follows:

1. Consumer costs are continually increasing because domestic inventories and supplies are inadequate to meet demands for distillate fuels to heat and power family dwellings, community facilities, hospitals, et cetera, in suburban and rural areas. This situation is graphically exemplified along the St. Lawrence River where a U.S. resident homeowner paid 16 cents per gallon for No. 2 fuel oil in the year 1969–70, while his Canadian neighbor on the other side was able to purchase the same commodity at 12 cents per gallon. The 25 percent premium paid by the U.S. homeowner on a necessity of life, namely, the fuel for his home heating plant, is clearly the result of unwarranted restrictions on imported distillate fuel oil.

Fortunately, this administration has seen fit to recognize such a situation as the above and has provided emergency quota relief by an additional allocation of 40,000 barrels of No. 2 fuel oil daily in the current program year. For situations such as this the oil import program should continue to remain sufficiently flexible to allow the administration to meet specific shortage and emergency demands on a prompt and expeditious basis and, indeed, the administration should be commended for its initiative in this regard. The program should be continued in such a way as to allow such initiatives to be undertaken wherever the need requires.

2. The acute need of urban area authorities to cope with air pollution by heat and energy production plants is so immediate and urgent as to constitute a clear and present danger to the maintenance of life. The majority view suggests that demand for low sulphur fuels in this area may be met by greater utilization of coal and what it calls "acceptable alternatives other than the importation of foreign crude."

Lacking such alternatives (and none are specified in the majority views) here or on the horizon we face pollution at such critical levels in our cities that it is imperative that the oil import program should not only permit but actively encourage low sulfur importation in whatever quantities are necessary to meet the demands for clean air now and in the foreseeable future.

We strongly urge that in no way would such an effort penalize the domestic production industry which by its own admission cannot now produce to meet the current and prospective demand. Rather, the upgrading of heating and energy production plants through the utilization of fuels to reduce air pollution could result in the development in the private sector of a new domestic energy industry. It should aim to capture a greater share of a growing market in much the same way as the major auto manufacturers are now planning compact cars to cater to the public requirements for less pollution nd more gas mileage in private transportation.

In the majority views the assertion that the price of natural gas will escalate to the disadvantage of the consumer of this type of fuel, unless imports are curtailed, is a conclusion which is somewhat questionable. In all probability the fact that natural gas resources are now inadequate, on the industry's own testimony, would tend to indicate that such testimony should be carefully evaluated for the following reason: If, indeed, natural gas resources are inadequate and the prices are due to escalate in keeping with an enlarged demand and an inadequate supply, it would appear that natural gas has been and is being oversold as a substitute for domestic heating oil and/or coal and not solely due to the introduction of imports. Whether import stocks are increased or not, natural gas as a source of energy and fuel would appear to be overextended and that the market as it now exists would be sufficient reason to promote new discovery operations to keep pace with the very demand created by the intense marketing activity of the natural gas producers themselves.

As to the supply of petrochemicals the undersigned agree with the subcommittee majority and separate task force in this particular. Both the task force, majority report and the separate report of Secretary Hickel and Secretary Stans agree that the supply of feedstocks to the petrochemical industry should be eased.

The separate report specifically recommends that petrochemical producers be provided with a growing volume of imported oil. In this the subcommittee evidently agrees and the undersigned heavily endorse this viewpoint not only to keep the petrochemical industry competitive in world trade but also to allow this vital industry to expand its production facilities. This is in the interest of consumer quality and price benefits and the expansion of employment through its unparalleled supply of opportunities for manpower utilization at attractive rates of compensation.

HUGH L. CAREY.
JAMES G. O'HARA.

MINORITY VIEWS OF HON. PHILIP E. RUPPE

After careful consideration of the findings of the Subcommittee on Mines and Mining of the House Committee on Interior and Insular Affairs on the oil import question, I recommend further analysis and evaluation of the divergencies of views expressed by the subcommittee and the Cabinet Task Force on Oil Import Control majority and minority. While I, too, question the optimism of the majority views, I believe that the merits of the majority position need to be carefully examined.

While there is no disagreement on the stated purpose of controls, to maintain a prosperous domestic industry in the interest of national security, I believe that further questioning of the efficacy, efficiency, and equity of the present mandatory import control program is warranted. I question whether present policy is the best to insure both a prosperous domestic industry and encourage growing sources of supply at a reasonable cost to the consumer. I feel that more alternatives should be developed and explored.

Specifically, attention should be given to the assertion that the practical effect of the current quota system is to protect U.S. producers of crude oil from the competition of lower world crude oil prices and, thus, maintain a much higher price level than would be possible without controls. State prorationing practices, justified in the interest of conservation and stable prices, need to be critically scrutinized. Curtailing production, rather than permitting maximum recovery from efficient low-cost wells, tends to impose a tax on the domestic consumer.

Other possible injurious effects of prorationing should also be examined. Since the stated goal of any oil import control program is to assure adequate sources of supply and incentives for further exploration and discovery, perhaps the prorationing system, which limits production, should be disbanded. While a relaxation of controls would bring a decline in price per barrel, it could also result in an increase in production, volume, and efficiency of wells, and thus comparable net revenue. Rather than a decline in the industry and diversion of manpower and resources to other sectors of the economy, maximum efficiency could be spurred, benefiting both producers and consumers I am not convinced that exploration activities would decline. The prospect of increased production and revenue could well provide the incentive to increase exploration and discovery operations.

In short, I feel that no recommendations can be adopted without further statistical evaluations. At a minimum, it seems we need to obtain and compare figures on current oil production costs and domestic production potential to projected needs and reliable outside sources of supply. Specifically, it does not seem that a concerted attempt has been made to obtain estimates of maximum domestic production in the absence of prorationing controls. In addition, thought could be given to alternative sources of supply such as the underground lines from

Canada and Mexico, the increased speed and efficiency of tankers, and the decreasing costs of oil storage.

Given the large divergencies in the figures produced by the task force and the subcommittee witnesses, I feel that every attempt should be made to develop an independent set of projections. For while projections remain subject to change, we can hardly attempt to estimate the likelihood and dangers of dependency on less reliable sources of supply abroad without first projecting our own production capacity and costs here at home. In essence, I feel that the subcommittee report has served more to justify the present oil import policy than to study and develop alternative policies. Such alternatives might well achieve a better balance between the national security, a healthy and expanding domestic oil industry and reasonable consumer benefits.

PHILIP E. RUPPE.

DISSENTING VIEWS OF PHILLIP BURTON

I believe that the basic economics which underly the oil import program, and which are carefully explicated in the Shultz task force majority report, dictate a different reponse to that report than that of this subcommittee. To that end and to conserve this debate, I will confine my own views here to what I believe are a number of mistaken or unfounded implications and assertions in the subcommittee's intended rebuttal of the majority conclusions of the Shultz task force.

For example, the subcommittee restates its own August 1968 findings that the import program should be continued because national security is a singleminded goal of governmental policy.

The subcommittee report in 1968 stated that consideration other than national security should not be given equal or greater weight and restates that again here with the new conclusion that no evidence has been developed which meets this standard.

I believe, however, that this subcommittee standard mistates the problem by implying that other considerations are given equal or greater weight by the proponents of change. Hardly. Rather, the Shultz report merely gave some consideration to these other concomitant and conflicting policy objectives—one of which incidentally is the preservation of the domestic oil industry. In any event, the most relevant question for the Shultz task force, but apparently not for this subcommittee report, is the comparative cost of the national security provided with the quota system. The Shultz report concluded that the cost of quotas was excessive. This conclusion came only after serious examination of whether there were less expensive methods (to consumers) to obtain our national security goals. I emphasize that price reduction would not have to occur in order to benefit consumers, for with a tariff plan, the consumer would gain not so much by price reduction, though some reduction is intended, as by a potential reduction in taxes. The tariff fees collected could offset other needed tax revenues, whereas under the present quota system the higher costs of crude oil are paid by consumers to private firms (mostly large oil refiners). I do not believe the subcommittee report rebuts these conclusions.

2. The report of the subcommittee implies that the Departments of State and Defense concur in its arguments; however, I do not believe that excerpts of the supplementary views of the Departments of State and Defense, which are sprinkled throughout this subcommittee's report, are probative of the points for which they are cited by the subcommittee. Indeed, these qualifications of the Departments of State and Defense are an eloquent testimonial to the quality of the other facts that forced them to recommend a change in the quota system.

3. The subcommittee report restates the minority conclusions of the Shultz report without new evidence or reasons. Measured by a generous standard, the minority conclusions of the Secretaries of Interior

and Commerce are arbitrary when not internally inconsistent. For example, the minority disapproves of a tariff system because it would substitute a tariff "which is highly undesirable and would lead to domestic and international problems of great significance [and] would result in price fixing * * * [and] would be a further retreat from a free market."

I believe that the American public deserves some good evidence for these conclusions. In any event, though a tariff system might indeed have problems, the relevant question is how these problems compare with today's quota problems. I believe the evidence shows that a tariff is on an almost all grounds less undesirable than a quota system. Moreover, I do not believe that the tariff proposal can be legitimately criticized for price fixing when the present quota system is even more effective in price fixing (though it is perhaps less obvious). For the Secretaries of Commerce and Interior to simply assert that a tariff (unless it is so prohibitive so as to serve as a zero quota) is a "further retreat from a free market" only indicates a very poor understanding of the workings of a free market. This is particularly true of the existing quota system in which quotas are distributed on nonmarket grounds.

In addition, I believe the conclusions of Interior and Commerce as to the economic dislocations which would result from any charge, are mostly overstated. Certainly the existing import quotas have become a part of industry structure; there is no question but that certain payments and jobs are dependent upon their continuation. But that fact does not in itself justify continuation. Every change of any proportion requires dislocations of this kind; the administration certainly can think of ways to cushion such changes, and the Shultz report does this by phasing in the changes, but we must accept that some will have to occur. Furthermore, it is the strength of a free market economy to absorb such changes and to create a more efficient structure upon them. My basic objections to the quota method of restricting crude imports is that it is unnecessarily expensive and inefficient. Thus, if one believes in the free market system, he has to believe that the economy would be strengthened as a whole by removing such expenses and inefficiencies. (Again, this is not to deny that local and sectional problems can develop but rather to say that they will be offset by other advantages elsewhere in the economy.) For example, the $5 billion cost of the quota system cannot be swept aside by the Secretaries of Commerce and Interior merely stating that this money goes to various sources and is therefore presumably justified.

This thinking could be used to justify any price increase or subsidy whatsoever; it is just as true of an unwarranted inflationary price hike as of the price for crude; further, one has to assume that consumers would burn the money saved or otherwise leave it unused, for in any other case the economy will get an equal—or even larger—boost as the money is spent on other goods.

4. The subcommittee's discussion of national security problem correctly focuses on the real danger of an extended cutoff of petroleum supply rather than the short-term affair which can be met by quite different kinds of insurance than a quota system. However, granting the possible long term threat itself suggests a number of attractive alternatives other than the hasty subcommittee conclusion that the

United States should provide most petroleum "from within its own borders." Other alternatives involve strong Western Hemisphere preference (given that a prolonged cutoff is not likely to result from a military war but from political or economic sanctions); stockpiled technologic developments like liquefication of coal, coupled with enough storage for temporary needs; or stockpiled oil fields in this country with current needs met from imports. I do not here advocate any one of these but do say that they are alternatives to domestic supply which appear attractive and most certainly were considered by the Shultz report.

5. The subcommittee's discussion of the tariff system as a method of controlling imports is, I believe, overly pessimistic about the difficulty of administering such a system. In any case, this complexity hardly denies the tariff's usefulness or merit—particularly when that system would not only end the unjustified subsidies to some companies but would also raise substantial amounts of revenue. I strongly disagree with the subcommittee's implication that a tariff system would be inequitable because it would favor those companies with the cheapest foreign source of crude. Indeed, I believe that this favoritism is desirable because it represents just what a free market system is supposed to do.

I regret that the limitations of time and space make it impossible to treat these essential issues more deeply; however, for all the reasons stated in this view, and in consideration of the additional arguments found in the Shultz Task Force report, I dissent from many of the findings and conclusions of the subcommittee report.

PHILLIP BARTON.

DISSENTING VIEWS OF THOMAS S. FOLEY

Some of the many deficiencies and disadvantages of the present oil import control program have been well set out in the dissenting views of other members of the subcommittee. Additional negative effects of the program could be cataloged but I will not attempt to do so in these brief comments. In general, I am persuaded that the present program is: (1) enormously expensive to consumers at every level, (2) productive of serious inefficiencies and inequities throughout our domestic petroleum and petrochemical industry, (3) of questionable value to our national security in any dimension and (4) in some aspects, directly contrary to our national security interests.

Nevertheless, we should carefully consider whether reforms of the present quota program are realistically possible, and could be of sufficient scope to justify its retention in some modified form; or whether the program should be totally supplanted by an alternative approach such as a system of tariffs as suggested by a majority of the President's task force.

I strongly believe that major modification or restructuring of the present quota program is clearly indicated and that indefinite continuation of its present structure and adverse effects cannot be rationally justified.

I must express my disappointment that the majority report seems to me to follow a pattern of uncritical support for the oil import quota program. This pattern has characterized many of the previous statements and reports of the Interior and Insular Affairs Committee.

At the very least, I believe that a continuing critical examination and analysis of the quota program should be conducted in both the executive branch and in the Congress. More serious than inaction, however, is the threat of the legislative freeze of the present quota program which would frustrate any effective reform or redirection by the Executive. Efforts to accomplish such a freeze are underway through the mechanism of including the oil quota program in pending legislation in the jurisdiction of the Ways and Means Committee. In my judgment it would be a tragedy if Congress were to approve such legislation.

In that unhappy event, Congress will serve the interests of that sector of the petroleum industry which enjoys the considerable special benefits and advantages of the present quota program. Congress would not thereby serve the interests of the petroleum industry as a whole, other domestic industries, or the consuming public. Nor, in my judgment, would such a legislative freeze advance any other public interest including the national security of the United States.

For these reasons, I must respectfully but strongly dissent from the findings and conclusions of the majority report.

THOMAS S. FOLEY.

Representative CAREY. Thank you, Mr. Chairman.

Chairman PROXMIRE. Thank you, Congressman Carey.

Mr. Simon, this is an excellent statement. It certainly is most appropriate. What we are mainly interested in in this committee—incidentally, the reason for our hearings as you know, is because this committee is responsible for economic statistics, basic economic data on which economic policy is made. As you say, so well in your statement, the data we are getting from the petroleum industry simply is not adequate. You say that emphatically. You say we need much more, it does not do the work. You say voluntary information is not enough. We need to require information to be submitted and you go on furthermore to say—I am delighted to see that you are asking for action by the Congress, legislation which would mandate this data and make it available.

All that is very welcome and I think most helpful because it is the kind of thing that I think we must have along with vigorous competition in the industry if we are going to solve our problems on disclosure. So we know really what the score is.

Incidentally, a little later on I would like to ask about our getting information and data about reserves in the public domain but that will come a little later.

You said in one of your provocative assertions at the beginning that you did not base the present policy of the administration in trying to bring supply and demand into adjustment primarily on price and price adjustments. Well, of course, we have a few other measures but it seems that very sharp increases we have already had in price, a sharper increase which you predict is going to come by next March, is certainly a fact of life and is going to have an effect both on demand and supply. You indicated that you have not much control because of the very great increases that we have suffered in the price of imported fuel.

Now, on that score we assume—we have got to get a figure, so let us assume the price of gasoline in 1972 was about 36 cents, might be a little more or less. The foreign tax, as I understand at that time, figures out to about 2 cents a gallon. If you figure the cost per barrel at $2.50, et cetera, the tax—the posted price was $2.50 the tax was about half that.

Now, in 1973 the price per gallon has risen to about 4 cents, or about 8 cents per gallon, but the foreign tax had gone up 6 or 8 cents but that applied to only one-third of the gasoline we were consuming. So that only 2 cents of the 8-cent increase could be accounted for by the increased price for foreign oil. And then we have the same kind of a situation coming up in 1974 where they tell us that the posted price is going to go higher and the foreign tax is going to go up to perhaps 16 cents a gallon and this would account, again adjusting for the tax that we had in 1972, the difference being 14 cents and the fact we are only using one-third of the oil that we consume in this country as imported, this would allow for a 5-cent increase. So I could see how we could justify perhaps a 38 cents a gallon price right now and perhaps a 41 cents a gallon price in 1974 based on increases in foreign taxes. I cannot see, though, how you can justify the rest of this enormous increase. Most of it seems to be

based on some other kind of a theory, either the costs have gone up here which I do not think they have by anything like that amount, or this kind of an immense increase is necessary to get more production.

What is the answer?

Mr. SIMON. Mr. Chairman, as you know, we have been dealing with this emergency energy crisis for several years. There have been many warnings issued by many experts, both within the petroleum industr and independents as well. We have been moving during this decade of the 1960's from an abundant low-cost energy base to what is now a high-cost scarce energy base. We had exploration peak in 1956 in this country. Production peaked in 1970 and imports continued to rise where they are now, as you accurately stated 35 percent of our domestic petroleum consumption.

Now, let me explain, a year ago at this time domestic crude oil was controlled, in our Cost of Living Council, et cetera, at approximately $3.40 a barrel here in this country. Everything was under price controls and still is. Now, if we want to induce additional domestic exploration and production, we have found all the cheap oil and gas in this country that we are going to find. Wells that cost $50,000 to $100,000 to drill a decade ago now in the lower 48, the on-land wells that must be drilled, we must bring out the additional reserves through the much more expensive secondary and tertiary methods of recovery. The Outer Continental Shelf drilling which hopefully will have between 40 and 45 percent of our proven reserves in the future, costs between $500,000 and $2 million a well. The North Slope—we recently had a dry hole reported. It cost $5.6 million to drill. The Cost of Living Council announced at that time that they would give an incentive for domestic drilling and that they would free-up for new production in this country, free from price controls and at the same time there would be a matched barrel from old cost control prices. This now accounts for approximately 12 percent of domestic production.

Second, the Cost of Living Council recently anounced an increase in the controlled price of old crude to $5.25 a barrel. This $5.25 a barrel was up $1 from the previously controlled price as this incentive, which had been announced by the Cost of Living Council on several occasions, but it is also up almost $2.

Now, that accounts for its percentage of our domestic production which is about 45 percent. This is the controlled price which is now at 5¼.

Now, for the past couple of years the Cost of Living Council has not allowed any nonproduct cost increase to take care of rents and inflation and everything else that has occurred, and they announced a 1½ percent nonproduct cost increase. Congress—1½ cents, I beg your pardon, cost increase to retail.

Stripper wells—a stripper well is a well that produces less than 10 barrels of oil per day. To encourage production, obviously, of these wells that pump this relatively small amount, it was felt by the Congress that they should be released from price controls.

Chairman PROXMIRE. Let me interrupt at this point to say that I realize that we need an incentive and perhaps a very sharp incentive

to encourage new oil, production of new oil, but I understand we have had a big increase in the price of old oil and a very big one, and I just cannot understand the reasoning behind the amount of the increase allowed there.

Mr. SIMON. Well, the price there again has gone from approximately $3.40 domestically controlled a year ago to the present price of $5.25 to take care, as I said, of the secondary and tertiary recovery which is more expensive. We have no intention of freeing up, if you will, from price controls the domestic crude.

Chairman PROXMIRE. Now, that is a massive increase, is it not, from $3.75 to $5.25?

Mr. SIMON. We have been exporting all of our exploration in this country—as I said, production has declined—exploration due to the fact that all the cheap oil and gas has been found and this incentive has indeed—we have got exploration going down in this country now on an all-out basis. All available rigs are presently being used. So we do not have to go to what I would call the emotional levels of the prices that are being charged by the Mideast and the other nations.

Chairman PROXMIRE. My question is, why we have gone as high as we have gone? Do you base that on independent data that you have or do you have to accept the cost data that the industry supplies without having a chance to verify?

Mr. SIMON. We have generated preliminary data in the Treasury that suggests that the long-term supply price of alternate sources of energy and domestic energy in this country initially would be in the area of $7, that this would provide sufficient incentive to bring on the massive capital investment, upward of $700 to $750 billion over the next decade.

Chairman PROXMIRE. Is it not true, though, that the $7 million is something you may need 3 or 4 years from now, or 4 or 5 years from now, I might say, but is that not a price you should not need this coming year? When you go to $7 will you not just have a windfall profit which really is not going to get much more production than you would get if you had a more moderate price?

Mr. SIMON. I agree with you, Mr. Chairman. By no means should we instantly go to a long-term supply price. We should continue to look at this and make sure there is not the disincentives created which would compel investment to go elsewhere and we have no intention of allowing price to go immediately to any level such as that.

Chairman PROXMIRE. The way this strikes me, here we have an industry which everybody now recognizes as being most profitable in the coming year. The president of the American Economic Association, Walter Heller, in an article in the Wall Street Journal just last week, pointed out whereas profits of corporations generally are expected to fall in the coming year, the increase in the oil industry is expected to be around $13 billion in profits, so massive that they expect overall profits to increase solely because of what is happening in the petroleum industry. Under these circumstances I just wonder if that kind of a colossal bonanza is necessary to get the kind of investment that we could use for more production or

if there is not a big excess here, a big price increase that the consumer is being required to pay which is unnecessary.

Mr. SIMON. Basically, what we have done is submit to Congress in the closing days of the last session a windfall profit proposal which the chairman of the Ways and Means Committee said he would bring up immediately on the Congress return. Basically, we are agreeing with you, that the individual companies should not profit from this supply-demand shortfall. But you must look at the profits.

Chairman PROXMIRE. Let me just ask about that windfall, so-called windfall profits tax. Is that not really an excise or a sales tax? What it amounts to, it is a tax on the gross price of the crude, as I understand it, that goes up as the price per barrel goes up, a price which in the present sellers' market will be shifted to the consumer. It is not a tax on the profits of the company which an excess profits tax usually is. I am against excess profits taxes but I think this is a good name, attractive name, good political name, but it is not an accurate description of what this is. Is that not right?

Mr. SIMON. We suggested the windfall profit tax because we certainly agree with you on the inefficiency of an excess profits tax, that we direct our windfall profit tax where indeed the windfall profit is and we suggest that is an opening dialog with the (a) options that we put it in this energy trust fund, or, (b), the partial or complete rebate to the companies who will indeed do the research and development.

Chairman PROXMIRE. Now, when you are moving in that direction, however, you must imply at least that what you favor is an increase in price to discourage consumption as part of your plan. I presume that is the real justification for having this kind of a heavy excise or sales tax on gasoline.

Mr. SIMON. We wish to remove from the companies the inequity of a windfall profit and spend the money where it can be most productively used for the benefit of the consumer because the consumer is the ultimate beneficiary when we bring on this self-sufficiency which we can so certainly do in this country with the abundance of natural resources and technology we have.

Chairman PROXMIRE. Now, how about the effectiveness of this tax? The Heller analysis indicated that the increased cash flow because of these increased prices from 1974 for the petroleum companies will be around $16 billion. He indicates the Government will get about $3 billion of that in this tax we are discussing and that the petroleum companies will get $13 billion. He said he can just see Congress rising to the bait on that one and the American public, too, when they really realize what it is. This is a fantastic enrichment and I just do not see any basis for feeling that this kind of enormous increase in profits is necessary to elicit the kind of production we all want to get.

Mr. SIMON. Mr. Chairman, what we are trying to do is encourage reinvestment in these industries and this proposal will commence the dialog before the tax writing committees of Congress that will define the best method to do this and in the intermediate and longer run to make sure we are going to have energy priced at the proper

level in this country and not be subject to the economic and political blackmail of any foreign nation for our increased needs.

Chairman PROXMIRE. How about approaching this by recognizing that the oil companies do pay very low taxes on their net income, something like 8 percent as a whole, the estimates I have seen, compared to over 40 percent for the rest of industry. Atlantic Richfield, for example, has indicated they feel that the oil depletion allowance is unequitable and unfair and very bad public relations for the industry. Would you consider the possibilities of eliminating the oil depletion allowance as part of the consideration for the increase in prices that the oil companies are getting under these circumstances?

Mr. SIMON. I must take off my Federal Energy Office hat and put on that of Deputy Secretary of the Treasury and assure you we are looking at the entire tax system as far as the petroleum industry is concerned today and we will have definitive proposals for the Congress.

Now, I note that Atlantic Richfield called for the elimination of the depletion. I think you will find that many economists have suggested that the depletion basically has been passed on to the consumer and has resulted in lower prices.

Chairman PROXMIRE. That is exactly right and that is one of the things that is wrong. It has resulted in a subsidization by those who do not use as much gas as against those who do, so we have been artificially maintaining too low a price in the past for gasoline.

Mr. SIMON. You will find it very——

Chairman PROXMIRE. The suggestion of Atlantic Richfield is it ought to be decided in the marketplace what the value of the gasoline is the way other commodities are. Therefore, you should eliminate this subsidization which does result in an artificial price by eliminating the oil depletion allowance and some of the other tax privileges the oil industry has.

Mr. SIMON. I think this can generate, as you can imagine, a very emotional debate in the Congress because the independent producers raise money from various sources, independent sources all over this country. They drill 70 percent of the new wells in this country and this depletion is used as an incentive for them to raise these moneys. So this is where we must weigh the tradeoffs on this.

Chairman PROXMIRE. Mr. Simon, my time is up.

Congressman Conable.

Representative CONABLE. I yield to Senator Javits.

Chairman PROXMIRE. Senator Javits.

Senator JAVITS. I am very grateful to my colleagues for their cooperation because I am under time pressure today.

Mr. Simon, just one question to follow that of Senator Proxmire, which I think is very pertinent on the national scene.

Is it not a fact that your answers have failed as yet to presuppose the factor of competition and the enforcement of the antitrust laws as between the oil companies themselves and the continuance of some form of price control, and that these are two very critical additional factors which the Government must crank in during this period in order to keep a balance between the public not being

fleeced—notwithstanding the fact that we want companies to make a profit and we want the attractiveness of the investment to get us more oil and many more efficiencies. But to keep the balance between the public interest in price and supply and the private stimulation of investment, is it not necessary to have a very keen and intelligent enforcement of the antitrust laws and to continue price control in this area?

Mr. SIMON. Well, I did address, Senator Javits, I believe, perhaps incompletely, my comments—we intend to continue as we do have extension of authority to control prices on crude and related petroleum products until February 1975 and we indeed intend to continue to control them and control them responsibly so they will not go to what I consider their again the emotional levels that are today being charged and would be charged in the event of the shortages that now exist. As far as the antitrust, I would certainly hope that the investigations that are and will continue to be carried on and indeed broadened, will again place the facts before the American people as to any problems there are in the antitrust area because I think that we have to look at the entire energy industry and take a look and one of the roles of the Federal Energy Office, looking beyond this current problem, is to forge a new relationship, both domestically and internationally, between the U.S. Government and its energy requirements.

Senator JAVITS. Now, do you feel that you have any authority either in existing law or do you want a new law to have a relationship to the antitrust laws and how they are administered, both at the State and Federal level?

Mr. SIMON. That would be a matter for the Justice Department to answer. I do not know.

Senator JAVITS. Well, what do you believe? What do you need? We are looking to you as the energy czar. Do you need to have anything to say about the administration and enforcement of the antitrust laws in order to do your job?

Mr. SIMON. No. I believe that is adequately handled in the Justice Department, Senator Javits.

Senator JAVITS. Do you have any relationship to them, or consultation with them?

Mr. SIMON. I do have direct liaison with the Attorney General and the Justice Department. The Justice Department is a member of the Oil Policy Committee of this Government.

Senator JAVITS. Well, now, do you count on the fact that there will be actual competition in price, service, delivery, et cetera, among the oil companies in order to carry out the policy in the interests of the Nation that you are charged to administer?

Mr. SIMON. We will most certainly assure that and we are illustrating that now with our IRS–FEO sweeps throughout the country and the investigations that are currently taking place right now.

Senator JAVITS. Now, you said that we will illustrate that, et cetera. I do not think you directly answered my question.

Mr. SIMON. Sorry.

Senator JAVITS. I consider the answer important. Your activities must assume that you will see to the fact that there is an effective

administration of the antitrust laws. That does not mean blind enforcement or the mere theory that bigness is wrong. It just means an effective enforcement in terms of this emergency. Do you count that among your duties?

Mr. SIMON. Absolutely.

Senator JAVITS. You talked about a law in which you could mandate from the oil companies the information that you need. Now, personally, I am quite prepared to sponsor or join in sponsoring such a bill and from what I heard from our chairman, he probably is, too. Perhaps Congressman Conable is, too.

Now, have you got one? Can you give us a bill that you wish to introduce which will get you what you want?

Mr. SIMON. We are working on that right now and have been during the congressional recess and we look forward to working with you because you can offer us suggestions on reporting requirements that perhaps we do not have because we cannot have all the answers.

Senator JAVITS. Well, do you plan to give us such a bill before the recess ends; that is, on January 21?

Mr. SIMON. I do not think we will have it before the recess ends; no, Senator. We will have it shortly after the recess.

Senator JAVITS. And you are prepared to cooperate with any of us that are so minded in the development of such legislation.

Mr. SIMON. I would be delighted. That would be to our benefit, Senator.

Senator JAVITS. Now, coming to New York, which has brought me down here, I would like to put two issues to you which involve not only the big companies that we have been discussing but independents as well.

Mr. Teretsky, the New York Federal Energy Office Regional Administrator, estimates a 200,000-barrel-a-day shortage of residual fuel oil in the Metropolitan New York area, the most severe for any area in the country, and obviously if we continue or worsen that shortage, we will have danger of electric blackouts of Con Ed, our principal supplier, which is receiving only about half its rseidual oil supply from its supplier, the so-called New England Power Co., Nepco. Now, if this situation is so, question: First, why aren't regional transfers being made to alleviate this danger to New York, and second, will the mandatory allocations going in tomorrow aid in the solution of this problem?

Mr. SIMON. The mandatory allocations that are being put in tomorrow are the most comprehensive ever put into place. They will encompass the entire barrel, if you will, fuel oil, distillates, petrochemicals, feedstocks, crude oil. They will direct themselves at everything from the producer level directly to the consumer. These regulations obviously will not be perfect. To allocate in this complex industry is extraordinarily difficult and I emphasize again as I have so often in the past, that any of these regulations that do not do what they are designed to do, we are going to maintain a flexibility and change them as long as it is done on an equitable basis.

Now, the problem with Con Ed is that it gets about 50 percent of its supply from New England Power whose supply is almost completely imported. We have been working with Con Ed to con-

vert its facilities from oil to coal where such conversion is essential to conserve residual fuel oil and where the environmental impact would not be too harmful and we have succeeded, working in conjunction with EPA, in doing this to a great extent.

In investigating the New England petroleum situation, together with Con Edison, we have found inconsistencies in the reports and we are bringing them all together down here tomorrow, Tuesday—Con Ed, New England Petroleum, New York State Power Commission and the mayor's office, to find out what the problem is and we will do whatever has to be done.

As far as diverting regions, we have been active in what we have called—we instituted an early warning system, recognizing the New England area imports about 85 percent of its needs and residual is needed in the New England area, I believe the figure is 80 percent of the residual that is used is in the New England area and we have diverted from the gulf coast and other areas of temporary surplus to the New England areas where we recognize there are critical shortages and if we have this early warning system working throughout the country, not only New England, working with the Governors' conference—the Governors' conference have their adviser based in our Federal Energy Resources Office here in Washington. They can warn us of the problem so we have the ability to act rather than react.

Senator JAVITS. Mr. Simon, we would like to sit in on your meeting tomorrow. Is that agreeable?

Mr. SIMON. Yes, sir, and also I have talked to Mayor Beame on the New York City problems after two snowstorms. We are allocating 100 percent to all cities for essential services and where this snowstorm that, of course, was not predicted, came on and used up gasoline supplies, we were able to get suppliers to redeliver additional supplies to New York City and it happened on two occasions within the last 2 weeks.

Senator JAVITS. Now, under those circumstances, and my reference to the fact that the New York area uses half the energy per capital of any other comparable population group in the country, is there any reason for these lines at gas stations, et cetera, in New York?

Mr. SIMON. Your major problem is just as it is in Arizona and Oregon, two other spot shortages. The distribution system is really very complex in this industry and there are going to be spot shortages and indeed even before the embargo, just as we had last spring and summer, spot shortages, and it is very difficult to predict which areas are going to be hit by these in advance.

Now, in New York City, it appears that many independents have gone out of business and under former allocation programs, if a gas station sold 50,000 gallons and got a percentage of this base period that is what he would get in the allocation program. Now, what we have attempted to do is put in an allocation program. Regardless of the number of gas stations left, and they are fewer, we are going to deliver what the area consumed rather than just do it on a gas station basis which will obviously increase the amounts but with fewer gas stations you are going to have lines.

Senator JAVITS. When you say we are going, what is your timing?

Mr. SIMON. This is right now. The regulations are out.

Senator JAVITS. Right now?

Mr. SIMON. Yes, sir. So they become effective tomorrow morning.

Senator JAVITS. Really, if there is good local information on what gas stations remain open and good service locally, there ought to be no lines in New York, is that right?

Mr. SIMON. They ought to be kept to a reasonable minimum, yes, Senator, but we find the buying habits of some of the American people now during this period of shortages have changed rather dramatically. As you know, a lot of people drive in and out of New York City every day and you are finding a lot of these people who commute by car filling up in New York City where they did not before. People are going in with three-quarters of a tank full and buying $2 worth of gas just to keep a full tank, so we have got more rolling storage than before, whereas before three-quarters of a tank was the average amount of gasoline a person used to carry, and that difference is about 3 million barrels a day.

Senator JAVITS. A New York Times analysis says all that means is about a day and a half supply and it should not materially affect the situation adversely, but can you advise the people, leaving to us our problems of consumer advice in New York, that there is really no need for hoarding and that the allocation to New York will be adequate for all reasonable purposes of travel, including going to work?

Mr. SIMON. Utilizing the 10 gallons, and let us all try to do that, I cannot reasonably assure anyone. I can assure them of our complete determination to make sure that the shortage that we are trying to spread throughout these United States is done on an equitable basis and one area, whether it is New York City or Oregon or Arizona, is not penalized in the process where they are flat out while other areas have supplies.

Senator JAVITS. What you are assuring them then is that they certainly will not be discriminated against.

Mr. SIMON. They will not be discriminated against but we still have, of course, a 20-percent shortage that we are presently dealing with.

Senator JAVITS. Thank you very much.

Chairman PROXMIRE. Congressman Conable.

Representative CONABLE. Thank you, Mr. Chairman.

Mr. Simon, are all our refineries now operating at full capacity?

Mr. SIMON. They are all operating at full capacity depending on what the amount of crude oil is. You know, when the figure came out on Texaco last week reporting all of its inventories and, of course, its inventories are much higher as all companies' inventories are higher, due to the fact that we had a warmer fourth quarter in 1973, that there has been a leakage in the embargo and indeed that our conservation measures—one key figure there in this again complex subject is that their crude supply is lower and their crude supply being lower means that refiners are going to begin to get less crude to refine for products and the inventories are ultimately going to suffer if this embargo continues and demand is not reduced.

Representative CONABLE. We do not have problems resulting from the availability of high sulfur content oil instead of sweet crude that has resulted in refinery capacity not being used?

Mr. SIMON. We have been experiencing that problem, Congressman Conable, for the past year and this goes back to an environmental problem where many of our east coast refiners are using the sweet crude for environmental reasons and denying the crude to inland refiners who must burn sweet crude waste. What we are doing is attempting to equalize refinery capacity more effectively for the amount of crude available in the United States. All of the refineries will be as equal as this allocation works, whether it is 100 or 90 percent that depends on the availability of crude.

Representative CONABLE. I read somewhere the Government had ordered shifts in refinery run between heating oil and gasoline. I wonder if you would describe that to us and tell us if there has been any waste of refinery capacity involved in these shifts and if we are currently putting the bulk of our refinery capacity where it is most needed. I assume we are but can you describe just in summary what kinds of problems you have in this area?

Mr. SIMON. We made a policy decision very early in the game, Congressman, and that was that the American people would be delighted to suffer some inconvenience and discomfort rather than lose their jobs. We felt that the tradeoff was to have the refineries which, remember, were constructed in this country to generate gasoline, to produce gasoline. The middle distillate, the middle part of the barrel for home heating and feedstocks for industry had to be maximized. If our thrust was going to be jobs and employment, a 15-percent cutback of the feedstocks in the petrochemical industry could result in $80 million and losing jobs. We have been so taking this into consideration. We wanted to make sure that the refineries were producing at a maximum rate to provide industry through our allocation program the middle distillate needed for the reasonable functioning of their particular business. That meant that we had to penalize gasoline production, if you will, and centralize the shortage in the gasoline area and we think this is the right position to take and the right policy to set, but as we look weekly and we publish our petroleum situation reports and look at how the leakage in the embargo and the weather and the conservation take place, we want to make sure that we keep a flexibility that will make sure that we do not have a lot of distillate at the end of the heating season and then all of a sudden have gasoline problems in the spring and summer, and this is judgmental and I suggest it is not very easy either to do, but what we are trying to do is make sure that this energy crisis that we have, the embargo, does not maximize or have a greater effect on the slowdown that was already going on in our economy and keep it under reasonable control.

Representative CONABLE. What kind of authority are you operating under when you make this kind of an order shifting of refinery runs?

Mr. SIMON. The Emergency Petroleum Allocation Act gives us that ability, and the Economic Stabilization Act.

Representative CONABLE. I think it is quite apparent that we have been fortunate the Arab embargo has not been more effective than it has turned out to be. Recent announcements about increased imports—I understand that is only part of the picture in terms of the availability of oil.

But I am wondering if we are not careful, if making better data on imports available is not going to permit the Arabs the information they need to make their embargo more effective.

Mr. SIMON. Congressman, we changed that reporting system, working with the Department of Commerce, and we just identify the aggregates. We do not identify on a country-by-country basis for exactly that reason, because we do not want to discourage the leakage.

Representative CONABLE. I think it is fairly accurate to say that our long-term problem is potentially much worse than our short-run problem unless we take the steps now necessary to make available additional resources and alternative resources. Can you tell me in your opinion, what are the most important things to be done right now so that we can get immediate increases in production and can you tell me what is most important, for instance, for 5 years out that we do now to avoid long-term—increasing and more acute long-term shortage?

Mr. SIMON. My most difficult job, Congressman, as I said so often, is going to be to keep the American people awake after the present embargo ends. This energy crisis has been coming a long time. We knew during the period of the seventies our imports would increase which has the two-fold problem of, (a) a supply cutoff at any time, and (b) subjecting ourselves to these higher prices. Unfortunately, there is no such thing as instant energy and the production of instant energy, but fortunately, we have the problem, as I said, due to the super-abundance of natural resources and technology in this country, to provide us with an answer over a period of time.

Now, let me tell you what our thrust is in the Federal Energy Office.

We have to establish a new energy ethic in this country because we are going to have to change our lifestyles. We are commencing studies in the Federal Energy Office now to present, and this will take a long time, proposals to the Congress on a sweeping change in the way we utilize our energy in this country. Six percent of the world's population utilizes 35 percent of this world's energy just in this country. There is obviously a lot of waste in that consumption. Some experts estimate it is between 25 and 40 percent. Preliminary industry audits—we have industry audit committees doing just the preliminary sweep through these companies—are providing us with initial results of 10 to 40 percent saving in energy. So we have got the new energy ethic, the conservation. We must continue. But we cannot continue to have our demands for energy increase 4 to 5 percent each year, which would mean a doubling of our energy again between now and 1990.

The new Government relationship must be forged, as I said, with our domestic industry and requirements. We must create the agency in the Government for the first time to put energy under one roof so we can establish the policy and do the research and development and implement the programs that are going to give us this ability for self-sufficiency.

Project independence, utilizing this super-abundance of natural resources and technology including the massive research and development program which the President announced. We have an infinite supply of coal in this country and due to a number of reasons we have allowed our coal industry to deteriorate where the coal industry today contributes 17 percent to our energy needs. We have 600 to 800 years of identifiable coal reserves and much more that can be brought out at different levels. Our estimates in oil shale that are 85 percent owned by the Federal Government, we have an equivalency of 1,800 billion tons equivalent to a barrel of oil. This is 47 times our proven reserves right now. But we have got processes that scientists have been arguing about which is the best one. We ought to take the synthetic rubber experience during World War II and look at the ingenuity of the American people and the free enterprise system that has made this country the greatest country in the world and start going on these processes and produce this additional. I could go on.

Representative CONABLE. Are you saying long term we can avoid this by allowing prices to rise because they can be economically feasible then and we can harness this remarkable system we have to generate these alternative sources?

Mr. SIMON. I could go on at great length, Congressman, through nuclear and gasification and liquefication and all the rest of it. Yes, indeed, we can at reasonable levels.

Representative CONABLE. But they are not economically feasible at current levels, are they?

Mr. SIMON. Congressman Conable, there are going to be oil shale pilot plants built because preliminary estimates show at around the $5 to $6 barrel equivalent which is where we have domestic oil right now, that oil shale is indeed profitable and we have one process, the in situ process, using conventional explosives that claim it is significantly less than that.

Representative CONABLE. Is that with an adequate environmental input as well?

Mr. SIMON. Yes. The in situ process actually keeps the environmental wastes below ground but I can suggest that takes some perfection. Gosh, we can solve this problem but it is going to require Government leadership and legislation and action on our part, at reasonable prices, I suggest.

Chairman PROXMIRE. Senator Javits has a question.

Senator JAVITS. Just one question on my residual time.

Mr. Simon, I did not ask you about the petrochemical business which involves heavy considerations of employment. We have an

enormous number of such manufacturers in New York who claim that because of the two-tier pricing system which is being enforced by the Cost of Living Council, there is a shortfall in domestic supply with heavy adverse impact on employment and that the very same items are being exported because higher prices are obtainable and that this is so true that there is now a black market in these basic materials for plastics in the United States and that this is an extremely adverse development to employment because there are many, many thousands of workers who could be thrown out of work in the plastics field.

Could you tell us anything on that?

Mr. SIMON. We recognize the fundamental nature of the petrochemical industry in these United States. As I gave the illustration before, 15 percent of the feedstock and its impact on the GNP and employment. And for that reason we have given 100 percent of current requirements in the allocation system to them.

We also recognize that there have been these charges made on exports that have been exorbitant.

Now, as you know, we instituted an export licensing system on petroleum-related products because we did not want anybody to take advantage of the higher price they can get from the foreign country at the expense of our consumer. We are investigating the specifics right now with the Commerce Department as far as whether an export licensing system is needed for the petroleum derivatives. Now, I will defer to the Cost of Living Council and to John Dunlop but I know he is looking at that problem as well.

Senator JAVITS. Well, I will get after him very hard and will you report to us on the findings of the Commerce Department?

Mr. SIMON. We certainly will.

Senator JAVITS. Thank you, Senator. I want to thank Congressman Conable for being so courteous.

Chairman PROXMIRE. Mr. Simon, the crux of the consumer complaints right now is the price, the price he has to pay for gasoline, the price he expects he may have to pay, and his indignation over that price. Recently two eminent economists released a forecast in which they assumed the price of domestic crude oil would average $7 a barrel. I asked you something about that. I would like to ask you a little more because I missed part of the point when I was questioning you a little while ago.

They assume the price will be $7 a barrel in 1974. You indicated, I thought, in response to me earlier that you thought the $7 a barrel might not be necessary or desirable or permitted in 1974. Do you think that $7 a barrel this coming year, this present year, is necessary?

Mr. SIMON. The Cost of Living Council announced a year ago that they would allow gradual increases to provide the incentives, Mr. Chairman, for exploration and drilling in this country on a continual basis and they have had three such increases since that time. We are presently at $5.25 controlled in this country on the domestic price of crude oil.

Now, we will continue to take a look, to make sure that that is a reasonable price under all circumstances but, remember, the new production in this country is uncontrolled.

Chairman PROXMIRE. I understand the President is signing an Executive order turning the price controls over to your office from the Cost of Living Council with respect to petroleum prices, is that correct?

Mr. SIMON. Yes, sir.

Chairman PROXMIRE. All right. Now, Mr. Ash has indicated the fiscal year 1975 budget will include—that is beginning next July 1—$4 to $5 billion in receipts from the proposed new excise tax on crude oil. That assumes a price of $7. Do you think that is sound or is Mr. Ash going too far?

Mr. SIMON. Well, here again, everyone has to make their judgments when they are asked specific questions about the figures, and you take a look at the average of old and new oil and, remember, the new oil that is brought on, the incentives for new oil plus the net barrel is uncontrolled in price. I can say what we have responsibility to control will be kept at reasonable levels in this country but the new oil, the stripper wells and the imports which abount to 55 percent of our domestic consumption, we do not have any control over and this is what is having the roll-in effect on the price of the gallon of gas.

Chairman PROXMIRE. What troubles me about the reasonableness, I think many people, even though they are very unhappy about paying more for their gasoline, if they thought that was necessary to solve the problem, they would be more willing to go along with it, but the oil companies themselves indicate that in 1974, whereas the economic estimates I suggested before indicate they will have a cash flow of net after taxes, even after the new tax, of $13 billion, they only plan to invest $10 billion. So does that not by itself indicate that the price is too high, unnecessarily high, and that it will not result in any substantial additional investment or production?

Mr. SIMON. All the data I have seen, Mr. Chairman, recently on increased R. & D. and domestic exploration and production has been dramatically above anything they have ever spent in this country before and in looking back on where their profits came from during 1973, preliminary figures suggest that it was mostly due to their foreign operations where the price of product has literally exploded, where tanker rates went to extraordinary levels due to world demand for product, and that domestically their prices were not as high as the overall profits.

Chairman PROXMIRE. Are you saying that their investment plans will be more than $10 billion?

Mr. SIMON. Oh, I have not seen the total numbers, Mr. Chairman.

Chairman PROXMIRE. Well, without seeing the numbers, how can you arrive at a fair price? It would seem to me that price should be related to how much they are likely to be able to invest productively and the incentive for making a further investment.

Mr. SIMON. Well, you have to look beyond what can be done in various areas because today we have a critical shortage of drilling rigs and tubular steel for drilling in this country.

Chairman PROXMIRE. Well, I suppose nobody knows more about what investment they are going to make than the industry itself and this was taken from their official estimates that they made themselves in November and December, as recently as you can get, in reporting to the Commerce Department.

Mr. SIMON. I think we have to take a look at what they are going to spend, relate it to the overall profitability of the industry, and then you arrive at your conclusions.

Chairman PROXMIRE. Now, let me get to an issue that relates directly to the jurisdiction of this committee and what we are here for this morning. When Congress returns we will resume consideration of the Emergency Energy Act. The version of that act agreed to by the conference committee in December requires reporting of certain data by the oil companies. Under this provision all companies engaged in production, processing, refining, or pipeline transmission of oil, natural gas, or coal would be required to report every 60 days on reserves, production, destination of production, refinery run by product and such other data as the Administrator may require. Do you support that provision?

Mr. SIMON. Are we basically going to broaden that? We are even asking for more than that.

Chairman PROXMIRE. Well, I hope so because as I understand it, the information we had on the floor at the time this was up for debate was the administration strongly opposed that provision and the impression was they opposed it on the grounds we were asking too much.

Mr. SIMON. No. Basically, what we were opposing at that time was the information was going to be sent to just everybody and as I mentioned in my testimony, the constraints. We have got legal problems on the proprietary information that is collected in this industry, and we felt that in order to get this information, depending on what type information it is, that it should not be so broadly disseminated. There is much of this—most of it, if you will, is going to be made public to the American people but some of it we are going to have great difficulty getting if indeed for proprietary anticompetitive reasons we were going to make it public.

Chairman PROXMIRE. Well, here is, I think, the crux of the difference because if we are going to develop public belief and trust and faith and support, they have to get the data. They have to get the information. And there always has been resistance and I have never been able to find any solid justification for the resistance on the part of industry for releasing the information of this kind. They say competitive but they certainly have a hard time showing how it adversely affects them. Do they have to make a clear showing that it is adverse?

Mr. SIMON. No. That, Mr. Chairman, is what we will have to decide in our dialog, what indeed the public should have and what indeed they should not.

Chairman PROXMIRE. Well, the conference committee report provides, and I am reading now:

> Upon a showing satisfactory to the Administrator by any person that any report or part thereof obtained under this section from such a person or from a Federal agency, would, if made public, divulge methods or processes entitled to protection as trade secrets or other proprietary information of such person, such report of portion thereof, shall be confidential.

Now, why would that not be adequate? This is what the conference committee report provided to protect the companies against disclosure of whatever could damage them competitively or in trade secrets.

Mr. SIMON. I believe also that the reporting of this would have gone to many, many Federal agencies and to all interested and not interested Members of Congress and we thought that in the interests of good order that it should be restricted. Indeed, reported to the Justice Department and FEO and the Interior Department, et cetera, but perhaps wisdom would suggest that it be done on a more limited basis. We would have no difference of opinion.

Chairman PROXMIRE. I do not think we differ.

Mr. SIMON. No, we do not. No, we do not.

Chairman PROXMIRE. It is very good to get you on record that way because I understand that what we need to have is this information disclosed saying that which can be shown clearly to be——

Mr. SIMON. Precisely.

Chairman PROXMIRE [continuing]. Adverse competitively.

Mr. SIMON. And that is where we want to work with you in developing what questions must be asked or have we gone far enough in asking these questions so we can make sure when this legislation comes before you it is as comprehensive as we need to get all the answers before the American people.

Chairman PROXMIRE. Another reason why there is such public concern and unhappiness is that the—there is such direct and explicit reliance on the basis of the report just erroneous information. The Wholesale Price Index, for example, for petroleum products is so inaccurate in the last 2 monthly releases the Bureau of Labor Statistics has inserted a warning that the data are not available. Now, we make policy in this country, we do, business does, on the basis of statistics of our Federal Government. BLS is working on an improved reporting system. It is my understanding that a major difficulty they have encountered with the oil companies is the refusal by the oil companies to supply requested data. Will you back up the Bureau of Labor Statistics in its request for price data from the oil companies and does either BLS or your energy office have the legal authority to compel submission of this data? If not, would you like Congress to provide it to you?

Mr. SIMON. We most certainly would cooperate in getting this data.

Chairman PROXMIRE. You would agree they should provide this to the BLS so the data can be applicable?

Mr. SIMON. Assuming the legality is in place, Mr. Chairman.

Chairman PROXMIRE. Once again, I want to go over a point I made earlier in questioning you.

The tax increase in December was from $4.25 to $5.25 a barrel.

Mr. SIMON. This is the price increase.

Chairman PROXMIRE. I mean the price increase. I beg your pardon. The price increase was $1 a barrel. What was your basis? What data did you rely on to determine that that was necessary? Was this completely supplied by the oil companies?

Mr. SIMON. What I would like to do is introduce Mr. Charles Owens, late of the Cost of Living Council, who is joining the Federal Energy Office, who participated in those discussions on the price increase from $4.25 to $5.25.

Mr. OWENS. In responding to your question, Senator, much of the data we used were based on our concern that there was supply or was supply available in existing reservoirs that was going untapped by our regulations because if these old reservoirs were subject to engineering through secondary and tertiary means, the oil, the additional oil produced from those reservoirs would nevertheless not qualify for our new oil price and, therefore, would not qualify for the incentive. We determined that this high cost engineering, secondary and tertiary processes, an additional dollar for the old oil would stimulate production for this oil but nevertheless as I said before, would not be subject to the new oil incentive.

Chairman PROXMIRE. How did you determine that? Who gave you the data?

Mr. OWENS. We have our own price gathering data. At the same time we determined the effectiveness of engineering methods. You talk with both engineers who are part of the industry and those engineers who are not a part of the industry but are involved in this kind of work.

Chairman PROXMIRE. Well, basically, was not that big 25 percent increase just decided upon by the industry itself? What independent basis would you have for deciding it was too much?

Mr. OWENS. For deciding whether it——

Chairman PROXMIRE. Whether it was too much. You say you had to rely on the engineers of the industry, have to rely on their estimates. The data that comes from them. It is not a matter they are just deciding what kind of a price increase they want and going ahead and putting this into effect in order to bring the so-called secondary and tertiary oil into production?

Mr. OWENS. Let me emphasize we talked to engineers who are part of the industry and engineers who are not part of the industry but sell their services, of course, to the industry, to give us estimates on the cost of this very expensive process on both the secondary and tertiary methods of recovery. I do not think the decision to increase those prices can be attributed to anyone else but the Federal Government.

Chairman PROXMIRE. Well, this is history. Let me see if I can get an answer on what is going to happen when we move toward that

$7 price. On the basis of the data which you say you are going to attempt to secure, Mr. Simon, do you feel that you will be in a position to make an independent determination, more independent, than you were when you permitted an increase—the Cost of Living Commission permitted this dollar increase, 25 percent increase—in crude in December?

Mr. SIMON. I most certainly do.

Chairman PROXMIRE. Specifically, where and how?

Mr. SIMON. All of the changes that we are going to reguire through mandatory reporting on reserves and cost of the various producing and new methods is going to be helpful in what we are trying to do as far as the price of domestic coal in concerned.

Chairman PROXMIRE. And you are going to get figures that you will be able to——

Mr. SIMON. Verify.

Chairman PROXMIRE [continuing]. Verify and contradict or challenge?

Mr. SIMON. Yes. We most certainly——

Chairman PROXMIRE. Audit the actual cost to determine whether they were incurred in fact.

Mr. SIMON. Yes. Indeed, we do that now but they will be verified.

Chairman PROXMIRE. But did you not indicate that your audit is primarily going to be confined to the refinery, refinery operation?

Mr. SIMON. That is the initial sweep that we are doing right now. As I also testified, we are going to put in a very broad mandatory program to deal with the petroleum in the future as far as——

Chairman PROXMIRE. Will that go all the way back to the cost of exploration, the cost of production, the cost of transportation, the cost of distribution? All of those elements as well as refinery?

Mr. SIMON. Yes, sir.

Chairman PROXMIRE. As I understand it, the refining process is only one part and a relatively modest part of the total cost of the oil.

Mr. SIMON. And basically, what we are trying to do is get an instant handle, if you will, during this period of emergency on the problems but it does not deal with the long-term system that is going to be put into place as far as the data-gathering is concerned. Much of this is done in various departments right now and we are going to bring it together in one department.

Chairman PROXMIRE. My time is up. For the record, I would appreciate it very much if you could have your office document exactly how you are going to be able to confirm the justification for the price increases beyond the present $5.25 a barrel.

Mr. SIMON. Absolutely, Mr. Chairman.

[The following information was subsequently supplied for the record:]

ECONOMIC STABILIZATION PROGRAM

COST OF LIVING COUNCIL news

Office of Public Affairs
Room 2104
Washington, D.C. 20508
Phone: 202-254-8830

FOR IMMEDIATE RELEASE
Wednesday, December 19, 1973

DOMESTIC CRUDE OIL PRICE ADJUSTMENTS

In further action to promote an increase in petroleum output in both the short term and longer run, the Cost of Living Council today permitted an increase of $1.00 per barrel in the ceiling price of domestic crude petroleum. This one-time increase, in addition to other product cost increases, may be passed through to consumers of petroleum products on a once-a-month basis in accordance with existing Economic Stabilization Program regulations.

Phase IV petroleum regulations establish a two-tier pricing system for domestic crude petroleum. Most of the crude produced in the U.S. is subject to a ceiling price which was fixed at the May 15, 1973, posted price plus $.35 per barrel. New production - that is, production above last year's levels - is not subject to the price ceilings and may be sold at free market prices. Crude produced from stripper wells has also been exempted from price ceilings by Congressional action. A total of about 25% of the crude produced in the U.S. is not subject to price ceilings. The remaining 75%, which is subject to the ceiling, is affected by today's announcement.

Council Director John T. Dunlop stated: "The Council's two-tier pricing system was designed to stimulate additional domestic crude production, while at the same time slowing the rise of domestic crude prices toward world price levels. When we announced the final oil regulations in August, we stated that we would continually monitor the ceiling prices of domestic crude petroleum and would periodically raise the ceiling price toward achieving parity with world prices."

Since that time the world price has increased sharply, creating a very wide spread between domestic crude prices and world crude prices.

During the same period the spread between the prices for new oil and old oil under the two-tier pricing system has also increased. Initially, the new oil price was quoted at about $1.00 per barrel over the posted price for old oil. At the present time, the spread has increased to about $2.00 per barrel on the average, and there are some quotes at more than $4.00 per barrel over the old oil price.

Spreads of this magnitude are potentially de-stabilizing and cannot long be maintained. Consequently, the Council has determined to increase the ceiling price per barrel for domestic crude by $1.00, which will reduce the spread and move domestic crude prices somewhat closer to world prices.

(more)

37-143 O - 74 - 8

Dr. Dunlop added: "Today's action is the result of an intensive review of both worldwide and domestic petroleum price movements and pressures. It is designed to reduce the economic impact of the present uncertainty of continued regular supplies of imported crude and is part of the President's long-range program to decrease the nation's dependence on foreign oil supplies.

"The increased ceiling price for domestic crude can be expected to generate only marginal increments to crude supply in the short run. Some increase, however small, is, of course, desirable in the current energy crisis. However, the announced increase will create additional incentive for the petroleum industry to pursue further research and developments efforts, new exploration and new technology to augment our energy resources."

Dr. Dunlop stated: "We anticipate this action, in combination with other government and industry programs, will help put our nation on the road to self-sufficiency."

o 0 o

CLC-489

December 19, 1973

Impact of One Dollar Increase

on Domestic Crude Petroleum Prices

Domestic Crude Prices

At the beginning of the year (1973), the average domestic crude oil price was $3.40 per barrel. In late March and early April the average price increased by 25¢ per barrel. A second round of increases averaging about 35¢ per barrel was interrupted by the price freeze announced by President Nixon in June.

Phase IV regulations were issued in August and permitted crude price adjustments of up to 35¢ per barrel to complete the second round of increases and return the domestic crude price structure to normal differentials. In addition, a two-tier system of crude pricing was established by the regulations. Most of the crude produced in the U.S. is subject to a ceiling price which was fixed at the May 15, 1973 posted price plus $.35 per barrel. New production -- that is, production above last year's levels -- is not subject to the price ceilings and may be sold at free market prices. Crude produced from stripper wells has also been exempted from price ceilings by Congress in the Trans Alaska Pipeline Bill and the Emergency Petroleum Allocation Bill. A total of about 25% of the crude produced in the U.S. is thus not subject to price ceilings. The remaining 75%, which is subject to the ceiling, is affected by today's announcement.

At the beginning of this month (December 1973), the price of "old" oil averaged $4.25 per barrel. "New" oil was selling at an average of roughly $6.17 per barrel, which was slightly above the average price of imported oil of $6.00 per barrel. (See chart) The average price for imported oil continues to rise at an accelerating pace due in large measure to the cut off of Arab oil shipments to the United States and reduced shipments of Arab oil to other oil importing countries. Prices for spot purchases of foreign oil, as opposed to continuing shipments, are reportedly ranging as high as $17 per barrel during the current crisis.

Imported Crude Prices

At the beginning of this year, the average price of imported oil ($3.34) was $.06 per barrel less than the average price of domestic crude ($3.40). Since then, prices for foreign oil have risen much more rapidly than prices for domestic oil. Foreign crude prices now average $1.75 higher per barrel than the price of domestic crude which is subject to the Phase IV ceiling. "New" oil, on the other hand,

has been selling at a higher price than imported oil on the average, but the price of imported oil is catching up rapidly. (See chart)

Effect of Increase

A $1.00 increase in the prices of "old" oil will result in an increase of the average "old" oil price from approximately $4.25 per barrel to approximately $5.25 per barrel. This dollar increase is expected to result in a comparable increase in the price of "new" oil, since "new" oil prices are generally quoted at a premium above "old" oil posted prices.

Impact on Product Prices

The price rules for petroleum products under Phase IV Price Regulations require that refiners allocate increased costs of crude petroleum to gasoline distillates and other covered products on the basis of historical sales volumes. Based on an average gasoline refinery yield of 45%, the crude oil price adjustment of $1 per barrel translates into a 2.3¢ per gallon increase in prices for gasoline, home heating oil and diesel fuel. This increase, together with other increased costs of imported and domestic crude petroleum, can be passed through on a once-a-month basis under the Phase IV petroleum regulations.

Supply Response

The increased ceiling price for domestic crude can be expected to generate only marginal increments to crude supply in the short run. Any increase, however small, is of course desirable in the current energy crisis. However, the announced increase will create additional incentive for the petroleum industry to pursue further research and development efforts, new exploration and new technology to augment our energy resources.

PETROLEUM PRICE INCREASES
1973
(National Average Prices)

	Jan. 10	May 15	Aug. 15	Oct. 15	Nov. 30	Cost Increase	Projected
Domestic Crude Prices							
Old crude (per bbl)	$3.40	$3.62	$3.86	$4.17	$4.25	$1.00	$5.25
New crude (per bbl)	-	-	-	$5.17	$6.17	-	-
Import Crude Prices							
Arabian Light (Per bbl)	$4.09	$4.24	$4.57	$6.62	$6.54	-	-
Libyan Crude (Per bbl)	$4.38	$4.62	$5.18	$9.53	$9.66	-	-
Average import	$3.34	-	$3.93	$5.24	$6.00	-	-
Price Differential Import Over Domestic Prices							
Difference over "old oil"	$ -.06	-	$ .07	$1.07	$1.75	-	-
Difference over "new oil"	-	-	-	$+.07	$-.17	-	-
Retail Prices							
Regular gasoline (per gallon)	37.2¢	38.4¢	38.7¢	39.7¢	42.3¢	2.3¢	44.6¢
Heating oil (per gallon)	19.4¢	21.7¢	23.9¢	26.3¢	28.4¢	2.3¢	30.7¢

Chairman PROXMIRE. Congressman Conable.

Representative CONABLE. Mr. Chairman, the great concern about the oil shortage and increasing cost here has led the public and Congress to look for scapegoats. We have had the Government as the scapegoat for so long and it dose not seem to do any good, in identifying it, so the oil companies are having the black mustache pasted on them right now.

We hear a lot about oil company profits usually expressed in terms of a percentage of their—of increase in profits. Do you have any summary of the relative profits of different industries in the Treasury that we can get hold of, both during the sixties and recently, reflecting this increase?

Mr. SIMON. We——

Representative CONABLE. Could you tell us, for instance, what the return on capital is in the oil industry compared to some other big industry like, let us say, the New York Times or Washington Post?

Mr. SIMON. We are preparing a detailed up to date analysis right now. There have been many studies done by the Chase Manhattan Bank about this industry and——

Reprensentative CONABLE. Are those accurate statistics?

Mr. SIMON. Well——

Representative CONABLE. Do you depend on them as——

Mr. SIMON. We use part of their data but basically, we are doing this independently right now to supplement what already has been done in the Goverment. Our preliminary assumption, using the figures 1972, is really fine. Profits have exploded for reasons I gave before. Foreign operations, the tanker rate increase, the explosion, if you will, in the European prices gave them a good portion of their profitability.

Looking at a net return on invested capital, I think we will find these studies are complete that compared to other manufacturing industries in this country, over an 8–, 10–, or 15–years period you will find they are in the middle range of these companies as far as their rate of return is concerned; and we will look back in calmer times, Congressman Conable, and suggest that this was an extraordinary period of profit for these companies.

Representative CONABLE. Let me ask you, if we get a little too tight on controls here or if we get too tough on the oil companies which are mostly multinational concerns—the big ones all are obviously, and are responsible for oil distribution all over the world—the result can be substantial diversion ultimately of oil into other areas. Oil does not flow uphill any more than water does and do you see any dangers here, and if so, how can we be sure that taking steps to protect the American people may protect them so well that we do not get any oil at all?

Mr. SIMON. I just could not agree with you more in the long term. That is why allowing moderate—and I use this term and emphasize the term "moderate"—increases really is insuring the longer run stability of the consumer in this country, recognizing the fact that the days of cheaper energy that we knew during this period of super-abundance, seemingly unlimited supply, is ended.

Representative CONABLE. We have heard a lot about the underestimation of reserves and it appears that there has been a substantial

underestimation of reserves, that this is not entirely the result of less consumption than we had thought. I am wondering how much of the underestimation of reserves relates to the real estate taxes paid by the oil industry. You take a State like Texas. It has no income tax. Quite obviously it taxes oil assets quite heavily as a matter of real estate taxation.

Has this resulted in a deliberate understatement of oil reserves by concerns—I do not mean to pick out Texas in particular but that is an obvious place to look at—to avoid real estate taxation?

Mr. SIMON. I have no knowledge of that subject whatsoever but this is one of the major reasons I am going down to Texas next week to speak with the Texas Railroad Commission. I am going to the other oil producing States and I will do the same thing and assess how indeed reserves are estimated in this country and what is the basis and who does it and thereby gain some accuracy.

Now, I know there have been reports of shut-in production in this country which have been proven to me. We do know, Congressman, one thing, that somewhere between 10 and 35 percent of the oil in the ground will come out on a primary recovery basis; that it requires, as we mentioned here several times this morning, the more expensive secondary and tertiary recovering processes to bring out the additional oil. Now, that oil is in the ground and so, therefore, we have obviously another pool of oil to go with the proven reserves that we have in this country today. So to that extent indeed, it is correct. There is more oil in there and it is going to take more money to get it out.

Representative CONABLE. But you have no knowledge of any deliberate underestimation of reserves by companies for real estate tax purposes. then. That is something that you will look into?

Mr. SIMON. Yes, indeed, I will look into it, but there again, all the production in the State is regulated by the State independent regulatory authories.

Representative CONABLE. With the price of fuel oil going up as it is and natural gas still regulated to the extent it is, can you give us any idea of the disparity in cost between the two at the present time and if this might not result in rapidly overtaxing our natural gas supplies? I know anybody building a new house up in my area does not want to have fuel oil as a mean of heating the house nowadays and the result is that oil distributors are taking it in the neck in relationship to the natural gas utilities. Can you tell me if this is creating serious problems that can put great pressure on our natural gas resources?

Mr. SIMON. It already has and this is illustrated by the curtailments in the natural gas area. This has been warned for the past 20 years, that the Phillips decision of 1954 which effectively regulated the priec of natural gas at the wellhead, Btu equivalent basis, at about six times under what its Btu equivalent is in a barrel of oil. So naturally, everyone wishes to use the natural gas. Natural gas being volume discounts to the electric utilities who were switched to —forced to switch from coal to oil and utilize natural gas to burn under burners, and this critical supply of reserves continuing to decline, we are just looking for a great deal of trouble and we have recommended that prices of natural gas be deregulated.

Representative CONABLE. Yes. I anticipated that conclusion on your part and so I would like to ask you how much deregulation of natural gas would cost the American consumer generally. New natural gas is——

Mr. SIMON. It is just——

Representative CONABLE [continuing]. All you are seeking to deregulate, is that not right?

Mr. SIMON. It is just the new natural gas, yes, indeed.

Representative CONABLE. So it would result in an automatic gradual increase in the price of natural gas in all probability that will still be substantially below the cost of oil and still be given a premium to natural gas consumption?

Mr. SIMON. Yes. It would be and there is also an overseer; that is, to put a cap on the price of natural gas so it does not go to what I describe as emotional levels but remains at a price that gives the incentive to bring on the new production and at the same time provides natural gas at a reasonable cost which is the——

Representative CONABLE. You feel that there can be safeguards to see that it does not cost the consumer an inordinate amount, at the same time trying to harness the laws of economics to keep us from having rather bad pressure on natural gas resources, is that right?

Mr. SIMON. I most certainly do.

Chairman PROXMIRE. Why cannot the Congress give the Federal Power Commission the authority to do exactly that? You have on the FPC now two members of the five who favor a complete deregulation of natural gas, two additional of the five who favor deregulating new natural gas. I presume the reason they do not let the price go up a little more than they have, although they have let it go up quite a bit, is because they have to relate it to a fair return. It seems to me that Congress could modify the law to give them a little more leeway to provide whatever is necessary for further incentive.

Mr. SIMON. That is correct.

Chairman PROXMIRE. And still keep it regulated.

Mr. SIMON. The national overseer, if you will, could be the Chairman of the Federal Power Commission or the Secretary of the Interior, as was suggested in our original——

Chairman PROXMIRE. Deregulate or washed out. Talk about a bonanza, you will have a situation—everybody indicates the price of natural gas will triple for 60 percent of our people who heat or cook with natural gas. That means a colossal increase in this cost. It means a $13 billion a year incease in profit for the oil companies plus a windfall because of their reserves of, I understand, around $150 billion. With that kind of colossal economic consequence it seems to me it is something we have to be pretty careful about.

Mr. SIMON. I agree with you.

Chairman PROXMIRE. I would like to ask you this. How high will the price go at the automobile service station gas pump? Is 55 cents the limit, in your view?

Mr. SIMON. I cannot set a limit because you are asking me to tell you—55 percent of our domestic consumption is uncontrolled in price. If you can tell me what the OPEC nations are going to be

charging for their crude oil 6 months from now, 3 months from now, then I will attempt to make the judgment on this.

Chairman PROXMIRE. Yes, but this is the kind of—in the first place, under the two-tier system with charging only a part, an appropriate part of the increase in price that is force by imported oil, and then it would seem, recognizing that price should be as much a consideration as how long the line is at the service station, in fact, it seems to me that is a far more objective and reasonable basis. When you move to rationing. you have a standby rationing scheme to which you can move. Would you be inclined to move to rationing if the price goes above 55 cents a gallon?

Mr. SIMON. I relate more the supply-demand as far as instituting rationing is concerned, and the equity, what we are asking the American people to do, using gasoline, just to use that one product, rather than providing a rationing program is going to do its job in keeping the price down. I do not see where the rationing program, Mr. Chairman, directly relates to the uncontrolled area which is going to get passed through anyway assuming the embargo ends.

Chairman PROXMIRE. But this could go sky high. In some foreign countries they are paying $1, $1.15, and $1.25 a gallion. The price a gallon could go up to 75, 80 cents under this kind of philosophy.

Mr. SIMON. Actually, Mr. Chairman, I think you will find that prior to the recent OPEC increases that the price in Europe was anywhere from 90 cents to $1.10 and 75 percent of that was taxes levied by the countries involved. So I would expect it would even go higher now.

Chairman PROXMIRE. The point I am speaking to is the elasticity of demand is such that people will, if they have to, apparently pay a great deal more than was considered possible before.

Mr. SIMON. But we are controlling the prices here at the pump on the gasoline price allowing the costs to passthrough for the higher price which we do not control such as the stripper wells, et cetera, and that will continue to be controlled.

Chairman PROXMIRE. But you refuse to tell us that you would not stand still, say, for a 60 cents, 65 cents, 70 cents a gallon price at the gas pump.

Mr. SIMON. Mr. Chairman, I can say that we are going to continue to control the price at what is controllable in this country and that we will keep it at these reasonable levels and if $5.25 is a reasonable level to get all the exploration and new production on line which we are going to have to watch very carefully, then that is where it ought to stay for a time.

Chairman PROXMIRE. Mr. Simon, nobody knows more about this than you do, in my view. On the assumption that the foreign price goes to, say, $13 a barrel, posted price, on that assumption, that seems to me about as high as it will go, maybe it will go higher, but stick with that assumption, then would you say that we should be able to maintain the price at 55 cents a gallon and if it has to go higher, that we will go to rationing it?

Mr. SIMON. The price will vary, Mr. Chairman, from market to market, due to the extent they rely on imports, so I would not put a number——

Chairman PROXMIRE. No, no. I am talking about the overall average price. It varies now. I paid 57 cents a gallon for gasoline just the other day.

Mr. SIMON. Which would be primarily the important—recognizing the fact that this supplier——

Chairman PROXMIRE. This is regular gas.

Mr. SIMON. The supplier was using imports. You will find others utilizing domestic, which is cheaper.

Chairman PROXMIRE. I am talking about overall. If the posted price is $13, would you permit the price to go above 55, 60 cents? How would you permit it to go?

Mr. SIMON. I am looking at this current price right now and what is the average price——

Chairman PROXMIRE. 44 cents?

Mr. SIMON [continuing]. Today, 44 cents. The full impact of the recent price increase has not been completely felt, obviously. We are going to see the price of gasoline from the levels of the increase go up in the area of 10 to 11 cents and that is where it should stay, assuming no further increases.

Chairman PROXMIRE. Well, I heard you say that and that takes it up to 55 cents. You do not assure, rather than permitting it to go higher, you would impose rationing. You would rather go higher if the situation changes, is that right?

Mr. SIMON. I just there again do not equate how rationing is going to keep this price down to reasonable levels, Mr. Chairman.

Chairman PROXMIRE. Well, you could certainly do it by rationing if you had the kind of white market system that you have indicated you are going to follow. I would think you could have the price at an even lower level, perhaps.

Mr. SIMON. The only way we could do that would be to restrict imports. That is something that some people are suggesting.

Chairman PROXMIRE. I am giving you the assumption of $13 posted price so the import price is fixed.

Mr. SIMON. And, of course, the tickets cost money where the people wish to exceed their—there again, that is a judgmental question, posted price of $13 versus $11.65 today. The actual price did depend on several factors. It is $8 FOB Persian Gulf today. Now we have to add on that what the tanker rates will be, the spot tanker rates, the long-term charter rates. So it is judgmental whether the oil is going to come into this country between $9 for the company-owned tanker rate or $9.25 all the way up to $11 for the spot market or perhaps even to $12 or $13 where these tanker rates have gotten as high as $4 a barrel of oil before. So believe me, I am not trying to evade your question but it is extraordinarily difficult to pinpoint and say we are going to hold to 55 cents or 50 cents for a gallon of gasoline on the average basis. The only thing I can say is I will continue to appear before you and other Members of Congress and answer my responsibility as far as the prices are concerned and maintain prices at the lowest reasonable level to assure the supply to the American people on an equitable basis.

Chairman PROXMIRE. And that could be 60 cents, 70 cents, no way of knowing, is that right?

Mr. SIMON. I do not see it going to 70 cents a gallon, Mr. Chairman.

Chairman PROXMIRE. If consumption is reduced as much as you want it to be reduced, what effect will this have on unemployment?

Mr. SIMON. The consumption of gasoline, I would hope——

Chairman PROXMIRE. We have had estimates that unemployment is likely to increase as much as 600,000. That is what one prominent economist estimated recently because of the energy shortage in the coming year.

Mr. SIMON. There again, the Council of Economic Advisers has attempted to do their studies with all the uncertainties involved and the major uncertainty is how the FEO does the job of allocation of product and if we do our job right and keep the embargo to a minimum—by supplying the middle distillates to the industries that need them for their feedstock, and there will be obviously a conservation and there is elasticity of demand, Mr. Houthhaker's recent study which is, I believe, the most comprehensive that ever has been done, coupled with that, should——

Chairman PROXMIRE. What does he estimate, minus 0.2?

Mr. SIMON. Really, over the intermediate term, the short-term elasticity of demand is relatively small but the intermediate and longer term is 6 months to 1 year. You can look for every 10-cent increase, a reduction in demand of about 7½ percent.

Chairman PROXMIRE. That means that you could get—probably have to get a 25-cent increase to get your 20 percent reduction in consumption.

Mr. SIMON. Well, coupled with conservation that we have already seen, that should be sufficient. We see American people today buying smaller automobiles, the automobiles that will utilize 20 miles to a gallon versus the big gas burner we have all been driving. I would hope that this change in buying habits would do it.

Chairman PROXMIRE. You did not give me a figure, did you, of what you expect the impact of the energy shortage would be on unemployment?

Mr. SIMON. The impact of the energy shortage coupled with a slowdown that has already occurred——

Chairman PROXMIRE. No. I just want the energy shortage figure. We have the estimate on the slowdown. We estimated—most economists have estimated about a 500,000 to 1 million increase in unemployment anyway, depending on their degree of optimism or pessimism. I would like to know what your—you are especially gifted to give us what the effect of the energy slowdown itself is.

Mr. SIMON. The Council of Economic Advisers—and they are the people who did this study—estimate that the energy problem coupled with the slowdown will not increase unemployment to more than 6 percent. It is extraordinarily difficult to just take energy outside of the rest of it. As you know, the adjustment assistance process of attempting to give the number of people who are unemployed due to the energy problem, it is very difficult to identify.

Chairman PROXMIRE. Mr. Simon, you say the companies should get together to develop an integrated program. Yesterday Attorney General Saxbe said something to the effect that would require

changes in the law because the Justice Department is so tough on them because if they get together even to play golf, the caddy might be listening. Do you have any notion how we could meet this antitrust problem?

Mr. SIMON. That is what we are going to have to be meeting with the Justice Department on, Mr. Chairman. You are 100 percent correct. We cannot call meetings down here and get this industry to sit in one room. We have to do it individually with their attorneys before they will respond to questions. They are extraordinarily sensitive and I guess for good reason, with the antitrust problems.

Chairman PROXMIRE. I would like to ask one other question I stated I was very interested in when we began. The energy resources owned by the Federal Government, what appears to be a great ignorance on our part as to what these resources are, what the reserves are, how much there is. From estimates I have seen, as much as 80 percent of the economically recoverable domestic energy reserves belong to the Federal Government in the form of oil and gas on the Outer Continental Shelf and coal and shale oil and other mineral rights on public domain lands, but it seems the Government is very poorly informed about the nature, extent and in some instances even the location of its own natural resources and ill equipped to learn where they are, where its energy resources are and how much are in its possession. Will you tell us whether you agree with the statement that the greater part of future oil and gas and coal, shale oil and other energy production will come from the public domain? Do you have any figures or estimates how much will come from the public domain?

Mr. SIMON. You are completely accurate in saying we do not have the accurate information. Remember, a lot of that is done on estimates and it is estimated that the Outer Continental Shelf, for instance, holds potentially 40 to 45 percent of our proven reserves and that is Federal lands. I have already stated that there are estimates that in the oil shale area, 2,800 billion equivalent barrels of oil, 85 percent of which is owned by the Federal Government. So we have a significant portion of this petroleum and nonpetroleum related future energy resources. And we are going to compile all this data as to——

Chairman PROXMIRE. You agree the present situation is not acceptable, that we must do far better in getting the information we do not now have.

Mr. SIMON. Yes, sir.

Chairman PROXMIRE. Why should not the Government have the capability of conducting its own seismic and geophysical tests, the means and facilities for gathering and analyzing its own information about potential reserves under the Outer Continental Shelf? Do you object to providing the Government with that capability?

Mr. SIMON. Basically, we do that in the Geological Survey now, the extent of which is rather small and I think it should be expanded.

Chairman PROXMIRE. So that we should rely more on the Federal Government in that way than we do.

Mr. SIMON. Yes, sir.

Chairman PROXMIRE. Just one point I would like to call your attention to and ask how you feel about it. Senator Nelson, my colleague from Wisconsin, has introduced a bill to provide something like the following: The bill would establish three categories of information within an energy information system in order to elicit as much information from corporations about the energy situation as possible. The first category would be public, the second confidential, the third secret. Each category of information would be stored in a separate library. Everyone would have access to the public library, only Government officials needing the data for official purposes would have access to the confidential library, while the secret library would be closed to all except the limited number of personnel needed to compile the data in that library for anonymous statistics.

What do you think of that kind of approach? Would it be helpful?

Mr. SIMON. Yes, it would be, and we are working with this committee right now on this piece of legislation.

Chairman PROXMIRE. So you in general support the principle.

Mr. SIMON. We have not come down—the principle, fine. The principle is supported. What we have to do is now get down to the specifics of it and that is what we are working on right now with them.

Chairman PROXMIRE. Congressman Conable.

Representative CONABLE. Thank you, Mr. Chairman.

Mr. Simon, we would carry on this interrogation at some length and, of course, we would like to if we had the time and you had the time to do so. The American public is extremely confused on this issue as to whether a shortage exists, how serious it is and what it means to them and I think it is terribly important that your office be as open and as accessible as you have made it during the past few weeks. You have been either appearing before some interrogation or holding press conferences or putting out statements daily, I believe, and I hope you will continue that. Energy is so central in our lives that we need this information, need it desperately, and I hope you will continue to be as open as you have been and will make every effort to get this information, complete information in as simple a form as possible because it is coming out now in piecemeal form and people write from a point of view or talk from a point of view and, therefore, the public feels as though it is being whipsawed about this information. So some sort of a central reporting agency is necessary. I do not know who it will be if it is not you in your office and I hope you will keep the tremendous importance of this to the credibility of Government and to the credibility of the public laws have have to make relating to energy which we obviously can no longer take for granted.

I have no particular additional questions in view of the further pressure on everybody's time here except I am somewhat surprised at your statement about the economic feasibility of developing oil shale at current levels. My understanding was that this involves a ton of oil shale for a barrel of oil and that fully to exploit this resource would require digging something of the equivalent of Suez Canal daily. I find it difficult to believe that if we have that kind of

environmental problem as well as that kind of a problem of materials handling that it can be done at this level. I think we have to be realistic about these things and I think also that those of us in Congress who have to concern ourselves particularly with the long-term shortages—we cannot do a great deal about the short-term shortages but we can about the long-term—have got to get as accurate information as possible about this sort of alternative, and so if there is any further information you can put in the record about the economic feasibility of these alternative sources, I think it would be of considerable use to the committee since we are a Joint Committee.

Mr. SIMON. Yes, sir. I agree with you, Mr. Conable, and let me explain that part of the answer, of course, rests in the fact that they are indeed financing these plants and they are financeable once the environmental constraints are met, and it is judgmental on their part also whether or not it is going to be economically feasible. They will not know until they try it. We have the uncontrolled system as far as pricing is concerned on new oil at present and, of course, that is partial incentive, but basically they are assuring us, various private interests that are willing to go out and spend their money to build these plants, that it can be done in this present range of prices.

Now, only time is going to tell whether that is true or not but on your first point which is what I consider the most critical, that the American people in their confusion, and I can understand that with the many statements that have been made, and their anger over the high prices——

Representative CONABLE. If I may interrupt at that point, according to the papers we are all going home to find out what the American public is thinking nowadays. That is pretty hilarious because we go home every weekend anyway and we get about—a little Congressman from upstate New York gets 1,000 letters in a week in the mail, so we do not exist in a vacuum as it is, but one thing that has been interesting to me as I ride around back home listening to the radio and reading the newspaper and watching television occasionally, is that there is simply a tremendous mass of contradictory information beleaguering the minds of the public particularly on something so important as this. They are not only confused, they are angry that there seems to be almost a conspiracy to confuse them about this and that I must say, is one thing I have learned at home that I did not expect to learn because I was not aware of what the people back home were hearing until I started listening to local news. I am not indicting you or our local news sources. They are every bit as good as anyone else in the country. They have a great system. I am simply saying the way it is coming out certainly is confusing and I hope you will do all you can to mitigate that condition.

Mr. SIMON. We will continue to be as open and responsive to getting the facts as I said right at the outset before the American people and at times there are reasons we cannot answer a specific question and that is frankly because we do not know, but we are working terribly hard to get the system into place that will satisfy these questions.

Chairman PROXMIRE. Mr. Simon, I have no more questions. Before you go, I would like to join with Mr. Conable in thanking you very much for your most impressive presentation, your obvious knowledge and understanding of this, and intelligence, and determination to get information. At the same time, it seems to me that we are left with some curiosity as to how serious a shortage we have. You say we have an energy crisis. We probably do but when we do not know really what the situation is because we have not learned from the companies, we have to send auditors out now to audit and verify the information we get, as you say, we have an abysmal lack of information about the 80 percent of the reserves and potential petroleum that the Government itself controls, very little information in that area, so it is very hard to come to a conclusion about how serious this crisis is and, therefore, what policy steps we have to take.

Finally, I also am concerned about what seems to me to be in all fairness a softness with respect to price. I appreciate that this is a very, very tough problem but I can tell you that is the problem that is really concerning the American consumer. The millions of people who have to buy gasoline and buy fuel oil for their house, that price going up constantly, and they do want to know that there must be some limit because it is getting to a point where people are going to have a great deal of difficulty getting to work and small business is going to have a lot of trouble operating because they simply cannot afford to do so.

I earnestly hope that we can arrive at a policy which can assure people that the price will not go above some definite reasonable limit. I know you are doing the best you can and I think that best is very good. I am very grateful to you.

Mr. SIMON. Thank you very much.

Chairman PROXMIRE. Thank you.

Our next witness is Ralph Nader.

Mr. Nader, I very much appreciate your willingness to come on such short notice and, of course, neither you nor Mr. Simon nor witnesses who appear today are required to provide statements because you were given very little notice. If you have a statement available I would be able to follow your presentation when you deliver it. If you do not, of course, that is understandable. Go right ahead.

STATEMENT OF RALPH NADER, CONSUMER ADVOCATE

Mr. NADER. Thank you, Mr. Chairman.

I would like to discuss this alleged energy problem from a consumer standpoint because I do not think the administration has focused on the consumer's interests other than to impose the principal sacrifice on the consumer.

Chairman PROXMIRE. Other than what?

Mr. NADER. Other than impose the principal sacrifice on the consumer.

There have been, earlier in 1973, detailed reports indicating that this energy crisis has been a created one. A principal report appeared in July in the Philadelphia Inquirer based on a long investi-

gataion by two of its investigative reporters. I could commend that to your attention as one of the best invetigative reports on this problem.

That was in July 1973, well before the stepped-up developments in the fall of last year.

Now, the words "energy crisis" are used very frequently without adequate definition. I think it is an energy crisis for consumers who are being subjected to billions of dollars of unarmed robbery by the oil companies in collusion with governmental support. It is most certainly not an energy crisis for the oil industry. Almost everything that has happened in the last few years, particularly in the last few months, will redound or are redounding or have redounded to the benefit of the oil companies. For example, prices have increased rapidly. Profits have increased rapidly. The tax system regarding oil industry activities overseas is increasing the benefits enormously. The writeoffs, for example, which the oil companies are taking on their U.S. Federal taxes via their payments of royalties and other expenditures abroad are increasing as the price per barrel abroad increases.

The pressure by the oil companies to eliminate or reduce pollution controls is initiated by this so-called energy crisis. The independent competitors, the gas stations and the independent refineries, are being put under severe pressure and in some cases driven out of business by the activities of the oil major, one of their principal objectives.

The pressure to develop, without adequate environmental controls, offshore drilling, particularly in the area around Florida and on the Atlantic Coast, is increasing to the point where the oil industry may succeed here as well.

The desire to increase the level of prices so that synthetics can become competitive, particularly from coal, is also another objective of the oil companies who have been buying up coal companies at a rapid rate in recent years.

I think in order to understand the administration's energy policy, one has to understand the chief implementer of that policy, who is William Simon. And in order to understand William Simon, one has to go behind the public relations facade that has created an aura of independent, decisive decisionmaking on his part. To understand Mr. Simon, one has to understand Mr. William A. Johnson, who is his principal economic and policy adviser. Mr. Johnson's beliefs, statements, and feelings are in accord with the most extremist representations of the American Petroleum Institute. I have seen him in action personally and have also observed a little-noticed speech dated September 13, 1973, which he delivered to an industry conference. And here was one of his principal conclusions. This is a man working for the U.S. Government whose presumed priorities should be the welfare of the consumer. He stated in that speech:

> Our short-term difficulties with gas, coal and oil are very likely the result of various ill-conceived policies of Federal, State and local governments. For years we have been sacrificing the long-term interests of the nation to secure short-run objectives as unrealistically low prices for consumers and the too rapid application of environmental costs and restrictions. Now, unfortunately, we are paying for those policies.

He went on to blame the problems in the coal industry principally on the Coal Mine Health and Safety Act of 1969 for what he called reducing productivity and output from underground mines. He also blamed restrictions which some States are putting on what he calls surface mining, what the people call strip mining. He also blamed air quality standards which have pushed the shift from coal to oil and he continually pointed out the usual American Petroleum Insitute statements that inadequate depletion allowances, too severe price controls on the industry, and other governmental policies have decreased the incentives for increasing the supply of crude refined oils.

Now, more than any other time, I think it is important to understand there is no Federal Government policy toward this energy crisis. It is clearly the oil industry policy. This is illustrated first, by the highly active policymaking role of various petroleum advisory committees, some of which have been in operation for many years, such as the National Petroleum Council and other advisory committees to the Department of the Interior and other Government agencies.

Secondly, the entire upper echelon of Mr. Simon's corps is industry-oriented. He himself has an investment banker background. He does not in any way appreciate the need for a powerful antitrust policy to break up the oil industry majors and to develop the kinds of marketing incentives that proceed from competition rather than from collusion or official price escalation.

The entire energy problem, I think, can be usefully broken down into four categories, supply, price, health and demand. In the supply area Mr. Simon's agency has not challenged the data of the oil industry and only recently is he promising to collect independently some of this information. It is important to realize that any Government agency can create a shortage by simply announcing it because when a shortage in a material good or a raw material is announced, there are several predictable consequences. There is hoarding. There is stockpiling. There is gueuing up. There is a black market. There are other market distortions. For example, if the White House announced tomorrow, mistakenly, that there is a shortage of straws, there would be a shortage of straws in the next few weeks because people would rush to buy straws, industry would stockpile straws, and there would be a blackmarket in straws and there would be other economic distortions.

Furthermore, the suppliers of straws would anticipate a price rise in the future so they would say why sell all our straws now when we can sell them 3 or 6 weeks from now at a much higher price?

The question, then, is, Is there an energy shortage? The answer, No. There is no physical energy shortage. I think there is wide agreement on this. The world is literally drowning in oil, traditional oil as well as the oil shale and tar sands and other forms of synthetics. It is doubtful whether one-fourth of the world's reserves of conventional oil have even been discovered. I think the industry will admit that possibly less than 60 percent has been discovered. But their record in public prediction of the oil shortage is about as bad as any industry record could ever be. If you read the history

of predicted shortages in the oil industry starting with the 1920's, the refrain is the same and the mistake is the same. Shortages are predicted, caveats about the need for higher prices and greater tax privileges are repeated, and yet the supplies keep increasing.

I would refer you, Mr. Chairman, to the Federal Trade Commission report on the oil cartel dated 1952, which gives a good history of this, at least up to that time.

The second question is whether there is a market shortage. That is, quite apart from what is under the ground, is there an availability of supply starting at the well to the refinery to the gas station or to the fuel distributor.

Here again, the assumption by the Government is that there is a shortage and as you just pointed out to Mr. Simon, you seem to infer that how could this be stated so categorically if they are just in the process of getting necessary information independently and not from the American Petroleum Institute or the American Gas Association?

Indeed, as economists have pointed out in elementary textbooks, the fact that a shortage can be created by a stampede or a mistaken impression from official sources does not mean there is actually a shortage. The Wall Street Journal recently had an article which also equated proven reserves with price and the authors of this article noted with the recent price increases proven reserves in the United States have about tripled. So proven reserves as defined by the oil industry and accepted by the Federal Government are those reserves which are technologically reachable under present economic conditions. So you are dealing with technology and price and, of course, technology has been improving in terms of drilling deep under ground for oil and recovering that oil for many years and price has been increasing quite substantially in recent years as well. So the secondary and tertiary recovery potential here is enormous and I would like to give you some rough comparisons.

If you called up the Geological Survey or the Department of the Interior this morning and ask what are the proven oil reserves in the United States, they would refer you to a compendium published by the Department of the Interior based on American Petroleum Institute figures as of 1972 which were 36 billion barrels of proven oil reserves. Any geologist you now talk to, even people in the Federal Government, will state that that figure is probably one-tenth of what the proven reserves are in this country, not those yet to be discovered offshore, or shale, of what the proven reserves are in this country given present technology and present price. Since the United States consumed about 6.7 billion barrels last year, that figure gives you an estimate of just how many years we have to go before we even run out of the proven reserves in existing wells that have been and are being exploited.

Second, turning over to the price area for a moment, it is no secret, rather, that the Federal Energy Office thinks that the way to solve this short-term energy problem is to drive the price up to a point where demand is decreased and production is increased.

Now, where they get the substantiating figures for this, I do not know. I do know that the Cost of Living Council a few weeks ago,

when they approved the price increase for old oil, domestic old oil to $5.25 a barrel, also stated they could not say at all there was going to be an increase in production. As far as the demand is concerned, one of the things that the oil industry learned sometime ago is that the consumer demand for petroleum products is largely inelastic. That is, they know that the American people, if they had to pay $1 a gallon, would pay $1 a gallon with very little reduction in the mileage that they travel in their automobiles. There may be a reduced demand by virtue of buying smaller cars but it is not likely it is going to be reduced demand of any significance by virtue of reducing their mileage, which are two different things that need to be made clear.

Now, Mr. Simon continually, and he did it today, uses the foreign price of oil as the reason why controls over domestic prices are unrealistic, if not impossible. It is quite clear that in this country 70 percent of the petroleum that we are now using is domestic, 30 percent comes from abroad, including Canada and Venezuela. I would suggest to you, Mr. Chairman, that you inquire of Mr. David Freeman, when he comes here this afternoon, as to his response for this elaborate rationalization of using foreign oil prices as a reason to permit domestic oil prices to increase.

One of the most striking phenomena of this entire energy picture is how both the oil industry and their Government supporters continually make elaborate arguments as to why prices of various forms of energy have to be increased to meet the competition. That is exactly the reverse of the way the market should operate. Prices are reduced to meet competition. They are not increased to meet the competition. And this is a point which I think reveals that what is required here is a very candid inquiry as to whether the Government really wants the market to operate and for the market to operate there needs to be a competitive industry structure as well. Really, what it is doing is developing an intricate type of corporate socialism where industry decisions are then adopted as governmental policies with all the full force of Government authority.

The health aspects of this energy problem have received probably the least amount of attention. I do not think it is accurate simply to talk about environmental effects. We are dealing here with the following. When Consolidated Edison switches from oil to coal, they are switching to impacting more people with more respiratory diseases and more cancer. That is what we are talking about. I would think that Mr. Simon should, every time he permits such a policy to go into effect on the part of a utility or a petroleum company, that he should also reveal to the public what the increased probabilities of death and morbidity are as a result. And I would suggest that he can get those figures from either the Environmental Protection Agency which has them for the New York area or from the American Public Health Association which has been putting out some very serious projections about increased disease and death as a result of the reduction of environmental controls on burning instrumentalities.

The aspect of nuclear power deserves a few sentences. I asked Mr. Simon recently, "Whether he supported the President's state-

ment before the Associated Press editors that there should be a speed up in the licensing of nuclear powerplants." He said, "Most definitely." I said, "Do you know anything about nuclear powerplants or does your office know anything about them?" He said, "No, that they rely on the Atomic Energy Commission."

Well, first of all, Mr. Nixon's San Clemente residence is next to a nuclear powerplant and even he did not know that there was a serious accident about 3 weeks before he made that statement to the Associated Press and that that plant was closed down completely because of that accident.

But more to the point here is an experiment which we conducted at the end of last year. We wanted to know who knew in the Federal Government what the reliability of these nuclear powerplants at any given point in time. We were not talking about the hazards of these plants. We just wanted to ask the question how many of these plants at a given time or date are producing electricity and how many plants are not producing electricity.

We first phoned up the Federal Energy Office, presuming they would have that information. They did not. We phoned up the Federal Power Commission. That Commission did not have the information. It took several calls to the Atomic Energy Commission before they produced the following report and the latest figures they have were for December 10, 1973.

Out of 38 operable nuclear powerplants in the United States, one-third or 13 plants were completely shut down on that date. Five were operating at full-power capacity. Six were not allowed to operate at full power bacause of safety problems and the rest were operating between 2 and 92 percent of capacity for various operational reasons.

Now, before we allow this energy crisis stampede to push us into a plutonium economy, I think we had better take very, very great caution in emphasizing in all our deliberations on this energy problem the health and safety aspects before we in turn are stampeded out of our consciousness and policymaking framework.

The last category of approaching the energy problem is from the demand side. Now, when observers from abroad comes to the United States, the first thing that strikes them is the enormous waste of energy. This is true whether they come from Japan or Britain or South America. What has to be, I think, emphasized is whether we really have an energy crisis if we are wasting 30 to 40 percent of our energy in our daily operations of building design, lighting, boiler inefficiencies, automobiles, other transportation systems.

Can anybody argue that they are lacking food if they overeat? I do not think they can.

Let me give you a few illustrations. The Office of Energy Conservation in the Department of the Interior, which has been advising Mr. Simon, has estimated that the waste factor in the economy alone is between 30 and 40 percent. Now, that is defined as the amount of energy that can be reduced without affecting productivity. If you look at some of the figures here, they are quite stunning. For example, General Motors a few months ago sent directives to its installations and is fully confident that it will reduce energy

intake in its installations by 20 percent this winter simply by the thrift factor and 15 percent over the entire year. ITT has also announced similar savings figures. In one plant in Camden, N.J., RCA cut energy intake by over 40 percent. Du Pont, which has a consulting firm advising companies how to save energy, states, "That at the minimum 15 percent of a factory's energy is wasted and could be stopped almost immediately."

To give you a few illustrations of the waste here, there is vast overlighting in buildings in the United States. New buildings are being built with 110 to 120 candle power when 30 to 40 candle power is more than enough for comfort and visual adequacy. Of course, automobile waste in terms of its consumption miles per gallon has long been known. So the same is true for many trucks rumbling over the highways.

Only 6 percent freight car utilization prevails in this country. Many European countries are up to 20, 25 percent of freight car utilization. Many of our freight cars are used for standing warehouses instead of shipping goods.

There also needs to be emphasized how important it is to try to develop policies, whether they involve deregulation by the ICC or other policies to shift more and more transportation to rail freight away from the far more inefficient freight on the highway.

In factories and offices in skyscrapers around the country, the traditional thrift factors of reducing thermostat levels, closing doors, improving new building design, adding insulation, circulating waste heat, improving boiler efficiencies, shutting off electricity for unutilized machinery and the like, could make a remarkable difference. In short, if we did nothing else on this energy problem but just cut out immediately avoidable waste we could walk our way out of this situation in the short term.

To give you an illustration which I think is a striking example, Mr. Chairman, of how we have developed an economy that is geared to using energy wastefully in order to jack up sales and profits for utility companies and energy suppliers, I would like to show you an illustration of how it could be done.

In the first place, Paris, which is no more technologically advanced than New York City, converts its trash to usable BTU's. Something on the order of 15 percent of its energy usage is reduced as a result of burning the trash to produce heat or energy. But closer to home, just as here at Baltimore Police Headquarters in Baltimore, Md. This is the system they use. And I quote from a description of this system which could be built all over the country presumably. It was built for the Baltimore Police Headquarters:

This building is being heated strictly from the heat generated by its lighting fixtures, electrical equipment and the personnel occupying the premises. In these times of severe energy crisis we cannot understand why Government agencies and private enterprise have not adopted this type of system in the construction of all normal office buildings. The principle of this system is based on the fact that more than enough heat is generated by standard lighting fixtures, electrical equipment and people employed in this building. All of this heat is simply returned through conventional building systems except that this energy is absorbed in water jackets in each and every lighting fixture and redirected through to areas where it is most called for. Rarely is the core of a building heated. It is only the perimeter. Therefore, this system simply

relocates the heat energy where it is required. The building does not have a boiler because of the utilization of the electrical energy required for lighting and, therefore, no air pollution of any type is being emitted from this building and the water that was utilized is recirculated and not dissipated. The system is useful in lowering air conditioning load as well by again relocating heat, thus saving electrical energy in the summer time.

This description comes from the company that supplied that system. We called up the Baltimore Police Headquarters to see if it was verified and we got the most casual affirmation, as if, sure, so what else is new?

Well, to most people in this country you think we have to go through the conventional pathways of more coal and more oil when there are many other alternatives that could reduce the need for these fossil fuels or make these fossil fuels more efficient. I think we should look at these and other illustrations and I think the joint committee could do no better service for the American public than to have a hearing on alternative sources of energy, many of which date back many, many years but which never were subjected to modest investment by corporations because they did not generate the kind of profits and the kind of control over supply that characterizes the fossil fuels economy.

Mr. Simon said in his statement this morning, Senator Proxmire, that the independent preliminary corporate audits which they are receiving reveal a 10 to 40 percent savings in energy that could be possible of being made. I would assume that is what it meant. Since industry and commerce in this country consume 70 percent of the energy supply—consumers only consume less than 30 percent, the rest is Government—the real savings are in industry and commerce. The 70 percent area, that is where the bulk of the waste is, but that is not where the Federal Energy Office is placing its policies or its public relations committees. They are placing it indeed more on the consumer rather than on industry and commerce where the very possible efficiencies could be passed on to the consumer.

Now, you showed a considerable interest in the degree of information which Government has received about these critical factors. I would want to suggest that although it is reassuring that Mr. Simon is going to Texas and Louisiana and Oklahoma soon to find out what the reserves are and how they are calculated and what the proper rationing formula is all about, and what the efficient utilization factors are all about, it comes a little late. I think it reflects on the sincerity of the Federal Government's efforts here. Not only should this information have been obtained by the Federal Government many years ago or 2 years ago or 1 year ago but certainly it should have been obtained last fall and I think it is only a reflection of the kind of pressure which this committee and other congressional committees and the public are placing on the Federal Energy Office.

I would not be optimistic, however, about the kind of information they are going to release to the public from their inquiries. Basically, there are three facets to the information disclosure problem. One, how much information is the Government going to get independently? Two, how much will the Government share with the American people? And third, how about the kind of information

that is generated about what these petroleum advisory committees do in shaping Federal policy behind closed doors here in Washington or New York.

I might add that many of these committee meetings are not open to the public, contrary to some of the statements made by the Federal Energy Office. There needs to be independently verified and obtained data on oil and gas reserves. There has been considerable emphasis from the FTC and elsewhere that these reserves are underestimated and certainly the definition of proven reserves provides opportunity for that underestimation.

There needs to be information obtained by the Federal Government about the research and development expenditures in the oil industry. Forbes magazine recently reported that oil has one of the lowest expenditures on research and development of any industry in the United States.

There needs to be data on the work of offshore operations. At the present time so strapped for personnel is the U.S. Geological Survey, and the Office of Management and Budget has strapped it continually in terms of not providing them with adequate personnel and computer facilities, that they basically rely on the oil industry to tell them how much oil and gas prevails on the land owned by the people of this country, the Federal land, which—even a banana republic, to use a much abused description, a banana republic would not tolerate that kind of delegation of critical information about the Nation's publicly owned oil and gas reserves.

Chairman PROXMIRE. Mr. Nader, would you wind up in a couple of minutes so we can get to the questions if that is all right with you.

Mr. NADER. Yes. I am about to complete it, Mr. Chairman.

The additional area, I think, of inquiry which the committee should go into relates to property tax assessments. While the value of energy resources in the ground, coal and oil and gas, has been going up, there has been no comparable increase in property tax assessments at the local level. As one of the members of the subcommittee pointed out this morning, there has been a strong incentive for the companies not to disclose their full reserves so they do not have to pay the full amount of property tax on those reserves to local governments.

Now, I do not know whether you intend to call Lt. Comdr. Kirby Brant up as a witness but I think he could provide some very useful information about one dimension of this problem; namely, Naval reserves. He is the Deputy Director of the Navay Petroleum and Oil Shale Reserves who just resigned in anger at the oil companies' policies and the Federal Government's practice. Press reports report him to have said: "I have written my last lie" in support of White House policy on the reserves. He has submitted a letter of resignation to the Pentagon which notes his complaints about the oil companies. To my knowledge, this letter has not been released publicly by the Pentagon. I think it would be useful for the subcommittee's deliberations.

In conclusion, Mr. Simon noted that he wanted the American people to have full information about the facts dealing with the

energy crisis. I would point out that that same Mr. Simon lobbyied very heavily a few weeks ago to reduce the information disclosure provisions in the emergency energy bill as it was arrived at by the House-Senate conference, and by virtue of his lobbying and White House lobbying, a number of critical areas of information which would have been shared by the public are now restricted to a few Government agencies.

That information, I am sure, is available to your staff and I think needs to be focused on prior to the resumption of the deliberations on this bill next week by Congress.

I would just like to comment briefly on one last point. Mr. Simon stated, "That the oil industry needs incentives to increase its exploration." We have been hearing this, of course, for years and the oil depletion allowance and other tax benefits have allegedly been given to the oil industry precisely for this incentive to explore. And yet the Federal Government does not reveal the extent to which, after receiving the benefits of the oil depletion and other allowances and writeoffs, the oil industry has allocated some of these or a large proportion of these benefits as Congress intended them to be allocated to domestic exploration. Instead, our tax system encourages investment abroad, both from wellhead to the retail area, and if anything, it biases the investment here not because the oil companies cannot get enough profits here but because they can get even higher profits in Europe and in Japan.

It is rather anomalous for an oil company like Exxon to tell the Congress that they need more incentives for domestic exploration when Exxon in 1972 and 1973 spent $250 million to change its name from Standard Oil of New Jersey to Exxon. I have yet to see a study of what the rate of return to that oil company is from the $250 million expenditure to change its name, to get that name across and to change its signs around the country and the world to Exxon.

Second, these oil companies have been spending tens of millions of dollars in institutional ads which prepared the public for this so-called energy shortage. And so deceptive are these ads that they not only have been the subject of numerous congressional criticisms but the FTC is completing a study with a possible objective of bringing deceptive advertising action against them.

Last, it is said that the companies have not been able to build refineries in this country because of environmental objections. This is unadulterated nonsense. First of all, the environmentalists just are not that strong and didn't even constitute an identity until the late sixties. Second of all, the entire projection of investment flow has been into Europe and Japan, not domestically, simply because they can get a higher rate of return in a faster growing market.

And third, you might ask the oil companies, Senator Proxmire, who opposed successfully the proposal by Occidental Petroleum Co. to build a 300,000 barrel a day refinery in Maine? To be sure, there were some weak environmental objections but the main opposition that defeated the construction of that refinery came from the oil majors, some of the seven sisters, working on Washington officials. They defeated that refinery because of their unwillingness for them to see an independent company share in the oil import bonanza and they did not want to see a free port.

These companies also successfully opposed other refineries when they were not their own. I think that needs to be very, very closely monitored by the congressional inquiry of which you are a part.

Thank you.

Chairman PROXMIRE. Thank you very much, Mr. Nader.

[The following information was subsequently supplied for the record by Mr. Nader in the context of his statement:]

RESERVES OF CRUDE OIL, NATURAL GAS LIQUIDS, AND NATURAL GAS IN THE UNITED STATES AND CANADA AND UNITED STATES PRODUCTIVE CAPACITY AS OF DECEMBER 31, 1972[1]

Part I. Report of the Committee on Reserves and Productivity Capacity of the American Petroleum Institute

INTRODUCTION

For the years 1946 through 1965, annual estimates of proved crude oil reserves in the United States were prepared by the American Petroleum Institute Committee on Petroleum Reserves. The API committee also cooperated with the American Gas Association Committee on Natural Gas Reserves in the preparation of estimates of proved reserves of dissolved gas and natural gas liquids.

In 1966, the API committee's name was changed to the "Committee on Reserves and Productive Capacity." In addition to continuing its work with respect to proved reserves, the committee's responsibilities were expanded to include the development of estimates for crude oil in the following categories:

1. Original oil-in-place and ultimate recovery categorized by: a. Geologic age of reservoir rock; b. reservoir lithology; c. type of entrapment.
2. Indicated additional reserves from cased-off reservoirs and from the future installation of fluid injection projects in known fields.
3. Allocations back to year of discovery of: a. Current estimates of ultimate recovery and, b. current estimates of original oil-on-place.
4. Reserves and production data by subdivision for the states of California, Louisiana, New Mexico, and Texas.
5. Crude oil productive capacity in the United States.

Estimates for categories 1, 3, and 4 were published for the first time in 1966, and comparable data may be found in subsequent reports.

Crude oil potentially available from cased-off reservoirs and from the future installation of fluid injection projects in known fields was reported in 1966 as "indicated additional reserves" (see category 2 above). However, since reserves from eased-off reservoics were found to account for only three per cent of total additional reserves, the committee discontinued this estimate. Consequently, indicated additional reserves as reported for the years 1967–1972 only include estimates of reserves from the future installation of fluid injection projects in known fields.

Estimates of crude oil productive capacity by states and major areas of states (category 5 above) were reported for the first time in 1967.

In order to properly interpret reserves and production data developed by the committee, the reader should be familiar with the underlying definitions and concepts. The section on concepts and definitions are, therefore, integral parts of this report.

COMMITTEE ORGANIZATION AND POLICIES

Each member of the committee (except the Secretary) appoints one or more subcommittees for the purpose of preparing reserves and productive capacity estimates for his area of responsibility. These Subcommittees, which are responsible for determining annual reserves and productive capacity estimates, are composed of geologists and engineers who (1) represent various segments of the producing industry having prominent ownership holdings in the Spbcommittee's assigned area; (2) have broad experience in the estimation of reserves and productive capacity; and (3) have an intimate knowledge of the

[1] Extract of pp. 4–25, 82, and 83, report by the American Petroleum Institute, dated May 1973.

areas and the more significant sized fields assigned to them. The Subcommittee are expected to make multiple assignments of selected fields to their members where it will beneficially contribute to the quality of reserve and productive capacity estimates and promote the exchange of expert views important thereto.

Members of the API Committee on Reserves and Productive Capacity, subcommittee chairmen, and members of the subcommittee are listed below. Areas of responsibilities, and subdivisions of California, Louisiana, New Mexico, and Texas used in reporting reserves data are shown on Maps I–V.

The Committee on Reserves and Productive Capacity operates under the API policy on petroleum statistics which includes the following:

"Statistical information is published under Institute sponsorship in the maximum degree of detail consistent with the safeguarding of proprietary information of individual companies, while mindful of the cost and utility of the data involved. The Institute's statistics are confined to current and historical data. The Institute does not participate in the publication of forecasts of future demand for petroleum or its products, nor of estimates of crude oil, natural gas, or natural gas liquids recoveries that are speculative in nature of that rely upon conjecture regarding future physical or economic conditions."

To assure continued cooperation of its subcommittee members who exercise complete integrity and a high degree of professional judgment in the performance of their assignments, the committee adheres to the firm policy of maintaining strict confidence with respect to basic data and estimates of reserves and productive capacity for individual fields. No member of the committee or its subcommittees is authorized to make available to anyone outside the committee organization any information beyond that which is published in this report.

Committee on Reserves and Productive Capacity

Members

M. W. Haas (Chairman) Exxon Company, U.S.A., Houston, Texas
Charles F. Bowden, Union Oil Company of California, Houston, Texas
W. M. Campbell, Atlantic Richfield Company, Dallas, Texas
F. L. Carpenter, Gulf Oil Company - U.S., Houston, Texas
W. A. Daniel, Mobile Oil Corporation, Houston, Texas
T. A. Dawson, Indiana Geological Survey, Bloomington, Indiana
J. K. Drisdale, Texaco Inc., Houston, Texas
O. A. Graybeal, Sun Oil Company, Dallas, Texas
A. T. Guernsey, Shell Oil Company, Houston, Texas
D. D. Little, Standard Oil Company of California, San Francisco, California
J. W. Phenicie, Amoco Production Company, Tulsa, Oklahoma
G. R. Schoonmaker, Marathon Oil Company, Findlay, Ohio
S. Smith, Phillips Petroleum Company, Bartlesville, Oklahoma
B. L. Waggoner, Continental Oil Company, Houston, Texas
J. E. Hodges (Secretary), American Petroleum Institute, Washington, D.C.

Members of the subcommittees

Adams, W. W.
Alkire, Robert L.
*Andrea, D. W.
Artley, Roger
Asbill, J. S.
Babione, Herbert A.
Barnett, K.
Barthel, B. O.
Baskin, Lloyd
Beckner, N. N.
Benavides, A., Jr.
Berry, George F.
Blanchard, L. A.
Blomberg, John R.
*Breaux, Ernest J.
Brown, Joseph
Cardwell, Dudley H.
Carr, L. A.
Chaky, Alex
Chatfield, Leslie E.

*Subcommittee Chairmen and Vice Chairmen.

Cheshire, M. E.
Clark, Charles R.
Cline, W. H.
Cochran, K. R.
Connelly, F. B.
Conner, William D.
Constant, Frank L.
Coppedge, D. A.
Coverstone, D. F.
Croushorn, Austin L.
Curry, J. R.
Daniel, W. B., III
*Davidson, Thomas L.
*Davis, Clyde
Davis, U. D.
Davis, W. C.
Daviston, S. E.
DeBrosse, T.
Dewlen, R. D., Jr.
Diver, C. J.
Dolph, J. R.
Douglas, E. R.
Dunn, J. B.
Dupuy, H. J.
Dye, C. C.
Ellison, Floyd
*Ellison, R. H.
England, Jack
Ewing, H. H.
Fallin, W. S.
Farrar, C. R.
*Fish, George E.
Fowler, J. C.
Frnka, W. A.
Galloway, J. R.
*Garner, E. S.
Gillespie, Murray
Gould, R. C.
Grasso, V. C.
Gray, Robert E.
Greve, J. E.
Hansen, P. W.
Harmer, R. W.
Haupt, H. J., Jr.
Heck, E. T.
Heinrich, Carl
Hickox, I. N.
Hill, Hayward H.
*Hunt, J. F.
Irwin, R. A.
Isaacs, V. A., Jr.
Jerry, D. W.
Johnston, Howard F.
*Jones, J. Paul
*Jordan, James R.
Jordan, Kirk
Jung, K. D.
Kallenberger, C.H.
Kellogg, Walter
Kiersznowski, S. E.
*Lancaster, William R.
Lane, R. D.
Lawry, Thomas
LeBlanc, C. J.
Lee, A. E.
Leighner, T. J.
Lembcke, R. R.
Leutz, W. K.
Linn, Earl H.
Lloyd, Frank T.
*Loper, Raymond G.
Lovingfoss, Warren J.
*Lynch, Harold W.
Lytle, W. S.
Mansoor, Raja A.
Marple, C. L.
Matthews, T. A.
McClellan, J. R.
McConnell, Kenner, Jr.
*McDonald, John R.
McMaster, C. G.
McMullen, Edward L.
Meek, J. W.
Milhous, Holman C.
Mills, Lloyd C.
*Morel, Thomas J.
Nabors, Fred L.
Nevill, B.
*Norgaard, P. B.
Olson, Dale C.
Patterson, W. M.
Paynter, W. T.
Pearson, Peter D.
Perry, A. T.
*Person, O. C.
Pert, D.
Peyton, W. L.
Plaza, Joseph B.

*Subcommittee Chairmen and Vice Chairmen.

Popovec, George
Robbins, C. B.
Roberts, C. A.
Robertson, C. L.
Robitshek, M. F.
Romine, L. D., Jr.
Rowalt, R. J.
*Sanders, John L.
Shambaugh, J. S.
Smiley, William G.
Smith, L. H.
Smith, W. D.
Stanfield, John
*Statler, Anthony T.
Steele, Horace C.
Stereck, R. J.
Stewart, Lyle
*Stocker, George R.
Stone, V. C.
Straw, Henry
*Stuart, O. M.
Sullivan, Dan M.
Summers, W. A.
Swingle, M. P.
Sykes, R. L.
Teer, George A.
Thiede, D. M.
Tsimortis, Paul
Van Tyne, A. M.
Van Zelfden, Gordon
Wade, Wallace L.
Wagner, D. P.
Waid, W. O.
Waugh, G. A.
*Wells, H. C.
Whitaker, M. T.
Whitlock, Edward
Wieder, C. A.
Wiesner, Gale M.
Young, Roger
Zerda, Kenneth V.

*Subcommittee Chairmen and Vice Chairmen.

CHANGES IN LIQUID HYDROCARBON RESERVES IN THE UNITED STATES FOR THE YEAR 1972

Summary data pertaining to reserves of crude oil, natural gas liquids, and total liquid hydrocarbons in the United States for the year 1972 are as follows:

Crude oil

[Thousands of barrels of 42 U.S. gallons]

Total proved reserves of crude oil as of Dec. 31, 1971	38, 062, 957
Additions to proved reserves in 1972:	
Revisions of previous estimates	820, 107
Extensions of old reservoirs	459, 311
New reserves discovered in new fields	123, 210
New reserves discovered in new reservoirs in old fields	155, 220
Total proved reserves added in 1972	1, 557, 848
Total	39, 620, 805
Less production during 1972	(3, 281, 397)
Total proved reserves of crude oil as of Dec. 31, 1972	36, 339, 408
Net change in proved reserves during 1972	(1, 723, 549)
Additional information:	
Indicated additional reserves as of Dec. 31, 1972	5, 190, 257
Total original oil-in-place estimated as of Dec. 31, 1972	434, 038, 198
Total ultimate recovery estimated as of Dec. 31, 1972	136, 253, 050
Cumulative production as of Dec. 31, 1972	99, 913, 642
Estimated "90-day" productive capacity per day attainable on Mar. 31, 1973	10, 301

Natural gas liquids

[Developed in cooperation with the American Gas Association]

[Thousands of barrels of 42 U.S. gallons]

Total proved reserves of natural gas liquids as of Dec. 31, 1971	7, 304, 227
Additions to proved reserves in 1972:	
Revisions of previous estimates	38, 796
Extensions of old reservoirs	112, 537
New reserves discovered in new fields	32, 652
New reserves discovered in new reservoirs in old fields	54, 288
Total proved reserves added in 1972	238, 273
Total	7, 542, 500
Less production during 1972	(755, 941)
Total proved reserves of natural gas liquids as of Dec. 31, 1972	6, 786, 559
Net change in proved reserves during 1972	(517, 668)

Total liquid hydrocarbons

[Thousands of barrels of 42 U.S. gallons]

Total proved reserves of liquid hydrocarbons as of Dec. 31, 1971	43, 367, 184
Additions to proved reserves in 1972:	
Revisions of previous estimates	858, 903
Extensions of old reservoirs	571, 848
New reserves discovered in new fields	155, 862
New reserves discovered in new reservoirs in old fields	209, 508
Total proved reserves added in 1972	1, 796, 121
Total	47, 163, 305
Less production during 1972	(4, 037, 338)
Total proved reserves of liquid hydrocarbons as of Dec. 31, 1972	43, 125, 967
Net change in proved reserves during 1972	(2, 241, 217)

RESERVES AND PRODUCTION—CONCEPTS AND DEFINITIONS

Crude oil.—Crude oil is technically defined as a mixture of hydrocarbons that exists in the liquid phase in natural underground reservoics and remains liquid at atmospheric pressure after passing through surface separating facilities. For statistical purposes, volumes reported as crude oil include:

1. Liquids technically defined as crude oil.
2. Small amounts of hydrocarbons that exist in the gaseous phase in natural underground reservoirs but are liquid at atmospheric pressure after being recovered from oil well (caseinghead) gas in lease separators,[2] and
3. Small amounts of nonhydrocarbans produced with the oil.

Statistical data pertaining to crude oil produceitn, reserves, and productive capacity are reported as liquid equivalents at the surfect (excluding basic sediment and water) measured in terms of stock tank barrels of 42 U.S. gallons at atmospheric pressure, and corrected to 60°F.

Proved reserves of crude oil.—Proved reserves of crude oil as of December 31 of any given year are the estimated quantities of all liquids statistically defined as crude oil, which geological and engineering data demonstrate with

[2] From a technical standpoint, these liquide are termed "condensate"; however, they are commingled with the crude steam and it is not practical to measure and report their volume separately. All other liquids recovered from natural gas (including lease condensate) are included in the natural gas liquid volumes reported by the AGA although some of the lease condensare which is recovered and measured separately from crude oil may be commingled with crude oil in pipelines when marketed.

Where a state regulatory agency specifies a definition of crude oil which differs from that set forth above, the Committee, for statistical purposes, follows the state definition. In the absence of a definition by a regulatory authority, reserves, production and productive capacity data are reported on the basis of classification made by the operator.

reasonable certainty to be recoverable in future years from known reservoirs under existing economic and operating conditions.

Reservoirs are considered proved if economic producibility is supported by either actual production or conclusive formation tests. The area of an oil reservoir considered proved includes: (1) that portion delineated by drilling and defined by gas-oil or oil-water contacts, if and; and (2) the immediately adjoining portions not yet drilled but which can be reasonably judged as economically productive on the basis of available geological andengineering data. In the absence of information on fluid contacts, the lowest known structural occurrence of hydrocarbons controls the lower proved limit of the reservoir.

Reserves of crude oil which can be produced economically through application of improved recovery techniques (such as fluid injection) are included in the "proved" classification when successful testing by a pilot project, or the operation of an instanced program in the reservoir, provides support for the engineering analysis on which the project or program was based.

Estimates of proved crude oil reserves to do not include the following: (1) oil that may become available from known reservoirs but is reported separately as "indicated additional reserves"; (2) natural gas liquids (including condensate); (3) oil the recovery of which is subject to reasonable doubt because of uncertainty as to geology, reservoic characteristics, or economic factors; (4) oil that may occur in untested prospects; and (5) oil that may be recovered from oil shales, coal, gilsonite and other such sources.

Indicated additional reserves.—With the present state of industry technology, certain quantities of crude oil (other than those defined and reported as proved reserves) may be economically recoverable from the following potential sources:

Known productive reservoice in existing fields expected to respond to improved recovery techniques such as fluid injection where (a) an improved recovery technique has been installed but its eect cannot yet be fully evaluated; or (b) an improved technique has not been installed but knowledge of reservoir characteristics and the results of a known technique installed in a similar situation are available for use in the estimating procedure.

Crude oil potentially available from these sources is reported as "indicated additional reserves." The economic recoverability of these reserves is not considered to be established with sufficient conclusiveness to allow them to be included in proved reserves; however, if and when improved recovery techniques are successfully applied to known reservoirs, the corresponding indicated additional reserves will be reclassified and added to the inventory of proved reserves. The "indicated additional reserves" are reported separately from "proved" reserves to provide continuity to the proved reserves' statistical series.

Indicated additional reserves do not include reserves associated with acreage that may be added to the area of a proved reservoir as the result of future drilling.

Discoveries.—Discoveries reported as of December 31 for any given year ar proved reserves credited to new fields and new reservoirs in old fields as the result of successful exploratory drilling and associated development drilling during the current year.

The reliability of estimates of the proved productive area of new discoveries or partially developed reservoirs varies in relation to the amount of geological information available at the time the estimate is prepareed. Important factors such as the areal extent of the structure, the average thickness of the producing reservoir, the oil column within the reservoir, and the continuity and characteristics of the reservoir formation cannot be determined accurately unless sufficient subsurface information is available.

The ultimate size of newly discovered reservoirs, whether in new or old fields, is seldom determined in the year of discovery. Therefore, first-year estimates of proved reserves in new reservoirs are often only a small part of the total that will be ultimately assigned to the new reservoirs. It follows that reserves credited to discoveries in any given year are usually less than total extensions and revisions for the same year, since extensions and revisions represent adjustments of reserves discovered in all prior years.

Subcommittees are not necessarily aware of and may not have access to the subsurface information for all new discoveries at the time reserve estimates are prepared. This is especially true if a discovery is made late in the year for which a report is being prepared or when competitive situations dictate that that the subsurface information be held as proprietary. In such cases, new proved reserves are reported in Table I as discoveries in new fields or new reservoirs in old fields for the year in which the discovery becomes known or when subsurface information becomes available. In Table III, these reserves are assigned to the year in which the field was actually discovered.

Extensions.—The ultimate size of newly discovered fields, or newly discovered reservoirs in old fields, is normally determined by drilling in years subsequent to discovery. Wells drilled in subsequent years usually add to the proved area of previously discovered reservoirs, thereby serving to increase estimates of proved reserves. The reserves credited to a reservoir because of enlargement of its proved area are classified as "extensions."

Revisions.—Both development drilling and production history add to the basic geological and engineering knowledge of a petroleum reservoir and provide the basis for more accurate estimates of proved reserves in years following discovery. Changes in earlier estimates, either upward or downward, resulting from new information (except for an increase in proved acreage) are classified as "revisions." Revisions for a given year also include (1) increases in proved reserves associated with the installation of improved recovery techniques; and (2) an amount which corrects the effect on proved reserves of the difference between estimated production for the previous year and actual production for that year.

Proved acreage.—Proved acreage is that which has been credited with proved reserves. Acreage is credited with proved reserves if the presence of a productive formation has been verified by drilling and testing. Undrilled acreage adjacent to drilled acreage and certain other undrilled acreage are also credited with proved reserves if geological and engineering information demonstrate with reasonable certainty that the underlying formations are continuous and productive.

Improved recovery techniques.—Improved recovery techniques include all methods for supplementing natural reservoir forces and energy, or otherwise increasing ultimate recovery from a reservoir. Such techniques include: (1) pressure maintenance; (2) cycling; and (3) secondary recovery in its original sense; (i.e., fluid injection applied relatively late in the productive history of a reservoir for the purpose of stimulating production after recovery by primary methods of flowing or artificial lift has approached an economic limit). Improved recovery techniques also include thermal methods and the use of miscible displacement fluids.

Reserves resulting from the application of any of the methods listed above are reported as "revisions" to proved reserves for the year in which successful testing by a pilot project or the operation of an installed program in the reservoir, provides support for the engineering analysis on which the project or program was based.

Original oil-in-place.—The estimated number of stock tank barrels of crude oil in known reservoirs prior to any production is defined as "original oil-in-place." Known reservoirs include (1) those that are currently productive; (2) those to which proved reserves have been credited but from which there has been no production; and (3) those that have been depleted.

The estimation of original oil-in-place is based on calculations using volumetric or material balance methods when sufficient factual data are available concerning reservoir rock, fluid properties, reservoir limits, and production performance. Where such data are not available, or are seriously incomplete, the estimation procedure utilizes information and performance characteristics from reservoirs believed to be comparable.

Ultimate recovery.—Ultimate recovery represents the estimated quantity of crude oil which has been produced from a reservoir and is expected to be produced in the future if there are no substantial changes in present economic relationships and known production technology. Accordingly, the current estimate of ultimate recovery is the sum of cumulative production to date plue the current estimate of proved reserves.

Ultimate recovery may also be expressed as the percentage of original oil-in-place which is expected to be eventually produced. This percentage will vary from one reservoir to another in accordance with the reservoir fluid, rock characteristics, and in the producing mechanism or drive which is present.

Assignment of current estimates to year of discovery.—The Committee determines and reports, in Table III, by the year of discovery, the ultimate recovery and original oil-in-place for each geographical reporting area. Also listed in Table III is the historical record of actual production and the year-end reserve estimate for all fields that were discovered during previous years as well as the year noted.

The year of discovery numbers are simply a listing of the ultimate recoveries and oil-in-place, as currently estimated, according to the year in which the fields and reservoirs were discovered. The discovery year is basically assigned as that of the initial field recovery. The reservoirs in these fields which may have been discovered in later years are combined, for this particular record and

tabulation, with that of the initial reservoir discovery. Excepted are those reservoirs which are themselves geologically significant and were discovered through application of a new exploration concept as compared to that which underlay the original prospect testing and discovery. For these latter reservoirs the assigned discovery years are the ones in which they were actually discovered. These assignment decisions involve geological and exploratory judgments best developed by the experts in the local Subcommittees.

Estimates of ultimate recovery and original oil-in-place for fields discovered in recent years are often subject to substantial revision in future years based on information provided by additional drilling, production and performance and the successful installation of improved recovery techniques. For this reason, caution should be exercised in the interpretation of recent data of this kind.

Geological information on oil occurrence.—Current estimates of original oil-in-place and the ultimate recovery of crude oil from known reservoirs (including those considered to be depleted) are differentiated in this report as follows:

1. By age of reservoir rock according to the geologic systems of the Mesozoic and the Paleozoic, and the series of the Cenozoic.

2. By Lithology of reservoir in three categories:

(a) "Sandstone" where quartz grains or other non-carbonate mineral or rock detritus predominate ranging in grain sizs from that found in siltstones through conglomerates.

(b) "Carbonate" where calcite or dolomite predominate.

(c) "Other" which includes occurrences in non-sedimentary rocks and in some sedimentary rocks such as fractured shale.

3. By type of entrapment under two broad categories:

(a) Structural traps which are defined as entrapments in which fluid hydrocarbon migration has terminated because of closure induced by structural deformation and/or hydroynamic forces. Most Gulf Coast piercement salt dome reservoirs are included in this classification.

(b) Stratigraphic traps which are defined as entrapments in which fluid hydrocarbon migration has terminated because of truncation, nondeposition, or facies changes in the reservoir rock. Where a pinch out of facies changes provide part of the barrier to migration and structural elements form the remaining closure, the entrapment is classsified as stratigraphic.

To the extent possible, the occurrance of oil is classified on the basis of a review of individual reservoirs. Where single reservoirs overlap various categories or cumulative production from several reservoirs cannot be separately identified, the local subcommittees exercise judgment in allocating estimates of production, original oil-in-place, and ultimate recovery to the various categories, or they assign all estimates to the category which dominates the ultimate recovery from the field. New information on reservoirs regarding age, lithology, and type of entrapment may cause some adjustments in previously published data; however, major annual revisions usually reflect revisions in estimates of original oil-in-place and ultimate recovery.

Production.—Crude oil production is the volume of liquids statistically defined as crude oil, which is produced from oil reservoirs during given periods of time. The amount of such production for a given year is generally established by measurement of volumes delivered from lease storage tanks (i.e., the point of custody transfer) to pipelines, trucks, or other media for transport to refineries or terminals with adjustments for (1) net differences between opening and closing lease inventories, and (2) basic sediment and water (BS&W).

For purposes of the annual reserves reviews, the subcommittees need production data for individual fields and for the specific geographic areas for which they are responsible. Since "official" sources such as state agencies and the U.S. Bureau of Mines do not provide the required detail, the subcommittees must analyze all available data (including company records, commercial services, state records, and Bureau of Mines reports) and make such adjustments as may be necessary to develop production series which satisfy their particular requirements. Because of differences in definitions and differences in data collection procedures used by various sources, and because of the variety of adjustments which must be made, production data used in annual reserves reprots should not be expected to agree precisely with that published by such sources as state agencies and the U.S. Bureau of Mines.[3]

[3] It should be noted that the difference between the final production data used by the Committee on Reserves and Productive Capacity and "official" sources are small. For example, the total U.S. production for 1971 shown in Table III of the report for 1972 is 100.1% of the total U.S. production reported by the U.S. Bureau of Mines.

In addition to the problems outlined above, it should be noted that when reserves estimated are prepared for a current year, the subcommittees only have access to actual production data for the first nine or ten months for that year. Consequently, production totals reported for the current year are preliminary *estimates* prepared by the subcommittee on the basis of incomplete information.

However, by the time teach annual report is prepared, the subcommittees have access to the "actual" total production for the preceding year and the figures shown on Table III are revised accordingly.[4]

Cumulative production.—The sum of the estimated crude production for the current year and the actual production for each of the prior years is the cumulative production reported by the committee. However, this cumulative productive is subject to the qualifications outlined in the section on production.

Offshore reserves and production.—The combined Louisiana–Texas offshore area, termer the Gulf of Mexico, is reported as a distinct geographical area for the first time in 1970. However, reserves, productive capacity, and related data for the offshore Louisiana–Texas Area are included in the land totals of each of the two states.

Offshore reserves in the Gulf of Mexico for the States of Louisiana and Texas are those which lie seaward of the Chapman Line and the coast line of Texas, respectively.

Productive capacity.—Estimates of productive capacities of crude oil developed by the American Petroleum Institute Committee on Reserves and Productive Capacity represent the maximum daily rates of production which can be attained under specified conditions on March 31 of any given year.

The definition of productive capacity used by the Committee is as follows:

"The ninety-day crude oil productive capacity is the maximum daily crude production rate, at the point of custody transfer, that could be achieved in ninety days (following December 31 of any given year) with existing wells, well equipment, and surface facilities—plus work and changes that can be reasonably accomplished within the time period using present service capabilities and personnel and with productivity declining as it would under capacity operation."

Estimates of the productive capacity of particular fields or reservoirs are based on proved acreage, wells, well equipment, and surface production families as of the previous December 31, with adjustments for (1) increases in productive capacity which would result from alterations and improvements in existing facilities and programs for development drilling and improved recovery techniques, which could be completed within the ninety-day period with existing capabilities and personnel; and (2) the natural decreases in productive capacity resulting from capacity operations during the ninety-day period. It should be noted, however, that there is no adjustment for additions to reserves and increased productive capacity that result from exploratory drilling during the ninety-day period. Furthermore, estimates do not include quantities of crude oil in lease storage on March 31 which could be drawn upon at the time of capacity operation.

Estimates prepared by the Committee are based on the following assumptions:

1. There will be no restrictions on production resulting from a lack of markets for crude oil.

2. There will be no change in crude oil prices or the unit cost of materials, equipment, and labor within the ninety-day period allowed for the buildup of capacity.

3. There will be no statutory restrictions on production, but gas and water production will be controlled according to prudent and accepted engineering practices, where appropriate, to prevent the significant reduction of crude oil recovery. The only other production restrictions applicable would be those which prohibit the pollution of water and those which prohibit air pollution with gas or the creation of fire hazards from gas by operations up to the point of transferring the gas to market or to gas processing facilities.

4. There will be no restrictions on production resulting from the inadequacy of storage or transportation facilities beyond the point of custody transfer.

5. Introfield equity considerations will be satisfactorily resolved so that production for given fields can be maximized.

---

[4] The difference between the preliminary estimate for any given year and the actual production for that year, as subsequently determined by the subcommittees, is treated as a "revision" in Table I of the following year's report. It should be noted that the original annual estimates of production used in Table II are not revised since this would disturb the internal balance and consistency of the reserves estimates.

TABLE I.—ESTIMATED RESERVES OF CRUDE OIL IN THE UNITED STATES

[Thousands of barrels of 42 U.S. gallons]

State	Proved reserves as of Dec. 31, 1971	Changes in proved reserves during 1972						Proved reserves as of Dec. 31, 1972	Net changes in proved reserves during 1972	Indicated additional reserves from known reservoirs
		Revisions		Extensions	New field discoveries	New reservoir discoveries in old fields	Production [1]			
		Plus	Minus							
(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Alabama	61,478	1,117	1,842	4,277	1,400	----------	9,696	56,734	(4,744)	32,521
Alaska	10,116,195	52,805	----------	----------	----------	----------	72,718	10,096,282	(19,913)	37,100
Arkansas	117,648	6,634	4,835	2,835	4,869	4,230	18,281	113,100	(4,548)	10,944
California [3]	3,705,750	273,951	89,002	4,243	1,700	3,905	346,812	3,553,735	(152,015)	1,473,150
Coastal region	543,772	56,940	15,012	640	1,700	3,685	78,403	513,322	(30,450)	246,250
Los Angeles basin	1,344,017	84,342	8,827	1,105	----------	20	138,609	1,282,048	(61,969)	499,500
San Joaquin basin	1,817,961	132,669	65,163	2,498	----------	200	129,800	1,758,365	(59,596)	727,400
Colorado	332,773	12,957	5,724	9,270	7,428	2,031	32,324	326,411	(6,362)	94,250
Florida	204,122	----------	149	8,946	11,193	----------	15,963	208,149	4,027	167,942
Illijois	208,763	17,046	18,186	269	105	19	33,133	174,883	(33,880)	9,100
Indiana	30,855	4,744	1,869	520	1,205	80	6,152	29,383	(1,472)	2,700
Kansas	501,552	33,228	23,418	11,379	4,276	378	74,001	453,394	(48,158)	11,750
Kentucky	52,548	2,349	483	3,000	70	490	9,781	48,193	(4,355)	2,800
Louisiana [3]	5,399,000	250,198	129,809	145,080	39,005	104,890	779,886	5,028,478	(370,522)	140,197
North	306,918	17,146	4,384	1,747	----------	460	40,436	281,451	(25,467)	31,712
South	5,092,082	233,052	125,425	143,333	39,005	104,430	739,450	4,747,027	(345,055)	108,485
Michigan	58,765	3,039	182	7,710	4,960	----------	12,290	62,002	3,237	3,100
Mississippi	342,368	27,980	18,472	12,572	6,778	1,824	60,592	312,458	(29,910)	23,452
Montana	228,185	45,917	6,834	4,876	3,008	----------	33,904	241,248	13,063	53,520

Nebraska	36,124	3,556	1,729	1,090	229	----------	8,717	30,553	(5,571)	4,775
New Mexico	656,885	59,541	41,047	9,784	3,087	801	106,458	582,593	(74,292)	121,111
Northwest	22,561	8,761	1,857	556	26	----------	5,801	24,246	1,685	5,125
Southeast	634,324	50,780	39,190	9,228	3,061	801	100,657	558,347	(75,977)	115,986
New York	9,772	400	----------	----------	----------	----------	926	9,246	(526)	2,000
North Dakota	174,011	11,110	1,382	2,074	1,300	----------	21,080	166,033	(7,978)	33,170
Ohio	129,144	----------	----------	7,576	23	----------	9,358	127,385	(1,759)	----------
Oklahoma	1,404,608	84,132	43,601	27,023	8,642	20,617	198,417	1,303,004	(101,604)	319,337
Pennsylvania	47,052	7,734	14,000	----------	----------	----------	3,441	37,345	(9,707)	42,770
Texas [3]	13,023,529	568,374	310,166	90,640	15,812	14,005	1,258,137	12,144,057	(879,472)	2,406,905
District 1	157,078	10,441	2,122	4,282	1,185	144	23,684	147,324	(9,754)	35,927
District 2	785,638	28,708	106,674	5,166	239	2,799	79,108	636,768	(148,870)	19,920
District 3	1,638,611	85,803	30,704	11,169	1,361	3,364	173,178	1,536,426	(102,185)	184,132
District 4	415,664	22,996	41,953	1,592	777	3,382	58,706	343,752	(71,912)	41,310
District 5	118,305	1,921	1,387	267	5	80	20,228	98,963	(19,342)	36,000
District 6	2,359,624	14,596	1,777	895	644	1,000	166,544	2,208,438	(151,186)	191,055
District 7–B	209,473	58,037	6,657	10,076	1,885	125	36,977	235,962	26,489	13,476
District 7–C	251,304	25,525	13,470	9,784	398	645	34,916	239,270	(12,034)	14,458
District 8	3,528,991	189,235	65,756	33,562	2,864	905	287,443	3,402,358	(126,633)	1,030,108
District 8–A	3,002,588	100,275	17,428	8,003	4,894	718	305,547	2,793,503	(209,085)	849,261
District 9	356,007	29,800	19,393	4,539	1,426	658	49,019	324,018	(31,989)	24,258
District 10	200,246	1,037	2,845	1,305	134	185	22,787	177,275	(22,971)	3,000
Utah	165,806	16,281	1,763	89,300	1,138	----------	26,365	244,397	78,591	35,800
West Virginia	51,731	----------	15,000	30	----------	----------	2,721	34,040	(17,691)	5,000
Wyoming	996,985	88,497	22,297	16,487	6,817	1,950	138,660	949,779	(47,206)	156,863
Miscellaneous [4]	7,308	319	12	330	165	----------	1,584	6,526	(782)	----------
Total United States	38,062,957	1,571,909	751,802	459,311	123,210	155,220	3,281,397	36,339,408	(1,723,549)	5,190,257
Gulf of Mexico [5]	2,748,310	109,199	87,447	100,526	36,500	65,836	407,062	2,565,862	(182,448)	29,515

[1] Preliminary esimate.
[2] Additional reserves include additional recoveries in known reservoirs (in excess of the proved reserves) which engineering knowledge and judgment indicate will be economically available by application of fluid injection, whether or not such program is currently installed.
[3] Includes offshore reserves.
[4] Includes Arizona, Missouri, Nevada, South Dakota, Tennessee, and Virginia.
[5] Included with Texas and Louisiana.
( ) Denotes negative volume.

TABLE II.—ANNUAL ESTIMATES OF PROVED CRUDE OIL RESERVES IN THE UNITED STATES 1946 THROUGH 1972

[Thousands of barrels of 42 U.S. gallons]

Year	Proved reserves at beginning of year	Revisions	Extensions	New field discoveries	New reservoir discoveries in old fields	Total of discoveries, revisions, and extensions	Production [1]	Proved reserves at end of year	Net change from previous year
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1946	19,941,846	1,254,705	1,158,923	(2)	244,434	2,658,062	1,726,348	20,873,560	931,714
1947	20,873,560	749,278	1,269,862	(2)	445,430	2,464,570	1,850,445	21,487,685	614,125
1948	21,487,685	1,958,853	1,439,873	269,438	127,043	3,795,207	2,002,448	23,280,444	1,792,759
1949	23,280,444	603,566	1,693,862	544,319	346,098	3,187,845	1,818,800	24,649,489	1,369,045
1950	24,649,489	663,378	1,334,391	407,739	157,177	2,562,685	1,943,776	25,268,398	618,909
1951	25,268,398	1,776,110	2,248,588	205,959	183,297	4,413,954	2,214,321	27,468,031	2,199,633
1952	27,468,031	743,729	1,509,131	280,066	216,362	2,749,288	2,256,765	27,960,554	492,523
1953	27,960,554	1,264,832	1,439,618	344,053	247,627	3,296,130	2,311,856	28,944,828	984,274
1954	28,944,828	537,788	1,749,443	307,625	278,181	2,873,037	2,257,119	29,560,746	615,918
1955	29,560,746	696,114	1,697,653	219,824	257,133	2,870,724	2,419,300	30,012,170	451,424
1956	30,012,170	804,803	1,702,311	234,727	232,495	2,974,336	2,551,857	30,434,649	422,479
1957	30,434,649	465,421	1,543,182	207,437	208,760	2,424,800	2,559,044	30,300,405	(134,244)
1958	30,300,405	954,605	1,338,908	151,210	163,519	2,608,242	2,372,730	30,535,917	235,512
1959	30,535,917	1,518,678	1,778,705	165,695	203,667	3,666,745	2,483,315	31,719,347	1,183,430
1960	31,719,347	787,934	1,323,538	141,296	112,560	2,365,328	2,471,464	31,613,211	(106,136)
1961	31,613,211	1,087,092	1,209,101	107,423	253,951	2,657,567	2,512,273	31,758,505	145,294
1962	31,758,505	759,053	1,041,257	92,488	288,098	2,180,896	2,550,178	31,389,223	(369,282)
1963	31,389,223	966,051	858,168	96,732	253,159	2,174,110	2,593,343	30,969,990	(419,233)
1964	30,969,990	899,292	1,419,182	126,682	219,611	2,664,767	2,644,247	30,990,510	20,520
1965	30,990,510	1,783,231	792,901	237,335	234,612	3,048,079	2,686,198	31,352,391	361,881
1966	31,352,391	1,839,307	814,249	160,384	150,038	2,963,978	2,864,242	31,452,127	99,736
1967	31,452,127	1,900,969	716,467	125,105	219,581	2,962,122	3,037,579	31,376,670	(75,457)
1968	31,376,670	1,320,109	776,780	166,291	191,455	2,454,635	3,124,188	30,707,117	(669,553)
1969	30,707,117	1,258,142	614,710	96,435	150,749	2,120,036	3,195,291	29,631,862	(1,075,255)
1970	29,631,862	2,088,927	631,354	9,852,512	116,125	12,688,918	3,319,445	39,001,335	9,369,473
1971	39,001,335	1,600,426	560,596	91,469	65,241	2,317,732	3,256,110	38,062,957	(938,378)
1972	38,062,957	820,107	459,311	123,210	155,220	1,557,848	3,281,397	36,339,408	(1,723,549)

[1] Production is the amount originally estimated and used by the committee in prior volumes of the reserves report. These figurds differ from production data developed by the committee and reported in Tables III and IV.

[2] A discoveries were classified as "new reservoirs."

( ) Denotes negative volume.

TABLE III.—HISTORICAL RECORD OF PRODUCTION AND PROVED RESERVES; ALSO THE ULTIMATE RECOVERY AND ORIGINAL OIL-IN-PLACE BY YEAR OF DISCOVERY, TOTAL UNITED STATES

[Thousands of barrels of 42 U.S. gallons]

Year	For all fields discovered to date		For fields discovered during year[3]	
	Production during year[1]	Proved reserves at end of year[2]	1972 estimate of ultimate recovery	1972 estimate of original oil-in-place
(1)	(2)	(3)	(4)	(5)
Pre-1920	5,064,485	----------	23,791,584	92,374,751
1920	442,609	----------	2,178,992	8,999,247
1921	471,379	----------	3,176,042	11,836,511
1922	558,689	----------	1,322,530	4,198,618
1923	732,850	----------	770,344	2,658,354
1924	713,081	----------	1,149,411	3,998,867
1925	763,927	----------	1,020,334	4,043,328
1926	771,137	----------	4,537,632	13,206,460
1927	901,722	----------	1,655,238	5,136,844
1928	901,443	----------	2,827,631	8,107,132
1929	1,007,382	----------	3,503,291	10,232,178
1930	895,966	----------	7,694,721	13,545,392
1931	850,017	----------	2,186,620	5,052,971
1932	783,542	----------	533,025	1,899,781
1933	904,930	----------	1,496,681	4,481,948
1934	905,681	----------	3,553,935	8,938,225
1935	991,590	----------	2,512,288	7,119,864
1936	1,086,896	----------	6,044,264	19,133,253
1937	1,265,222	----------	3,411,580	8,456,386
1938	1,202,243	----------	3,985,968	10,457,616
1939	1,253,416	----------	1,862,596	5,414,609
1940	1,334,525	----------	3,752,380	8,954,687
1941	1,388,985	----------	2,255,469	7,088,469
1942	1,374,132	----------	1,345,953	4,361,135
1943	1,492,529	----------	1,332,761	4,139,794
1944	1,669,218	----------	2,269,874	7,475,451
1945	1,704,786	19,941,846	2,084,030	6,929,372
1946	1,727,701	20,873,560	1,478,183	4,166,593
1947	1,850,420	21,487,685	1,492,011	5,702,871
1948	2,002,162	23,280,444	3,403,783	8,614,250
1949	1,823,873	24,649,489	3,079,560	15,843,161
1950	1,950,866	25,268,398	2,592,129	7,395,828
1951	2,211,770	27,468,031	1,630,523	6,083,686
1952	2,256,380	27,960,554	1,386,929	4,824,054
1953	2,313,492	28,944,828	2,099,629	7,934,817
1954	2,272,320	29,560,746	2,143,163	7,097,356
1955	2,425,176	30,012,170	1,487,405	5,570,146
1956	2,558,813	30,434,649	1,794,826	6,256,007
1957	2,558,873	30,300,405	2,071,249	6,525,982
1958	2,377,009	30,535,917	1,040,927	3,677,539
1959	2,493,505	31,719,347	705,810	2,688,489
1960	2,472,913	31,613,211	874,472	2,963,247
1961	2,507,823	31,758,505	467,156	1,921,212
1962	2,552,006	31,389,223	970,856	2,727,323
1963	2,613,309	30,969,990	621,772	2,252,549
1964	2,645,453	30,990,510	814,525	2,966,775
1965	2,699,282	31,352,391	1,071,157	4,102,434
1966	2,864,127	31,452,127	467,818	1,924,253
1967	3,047,233	31,376,670	733,834	2,846,382
1968	3,160,987	30,707,117	10,378,768	26,798,602
1969	3,188,010	29,631,862	444,699	1,580,337
1970	3,328,008	39,001,335	464,462	2,044,239
1971	3,298,352	38,062,957	196,215	789,415
1972	3,281,397	36,339,408	86,015	499,408

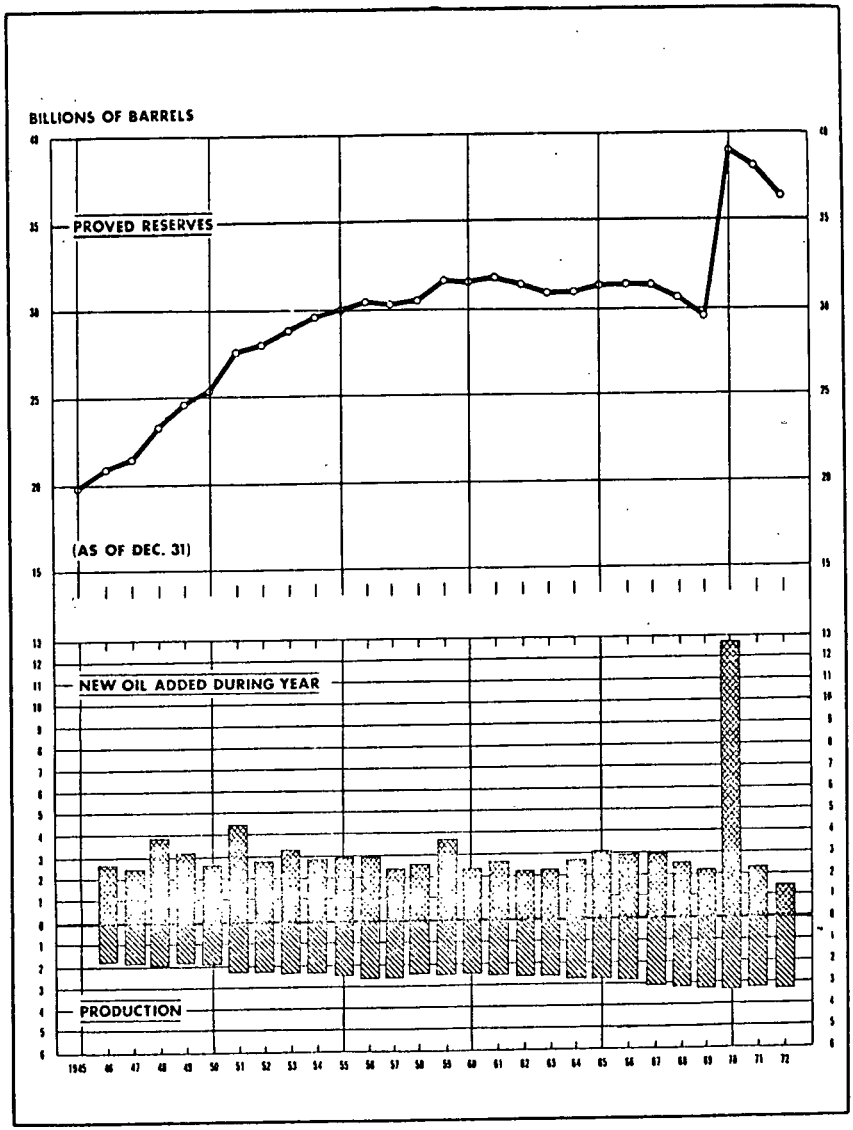
[1] Actual production except for latest year reported. See Appendix A for sources of production data used.

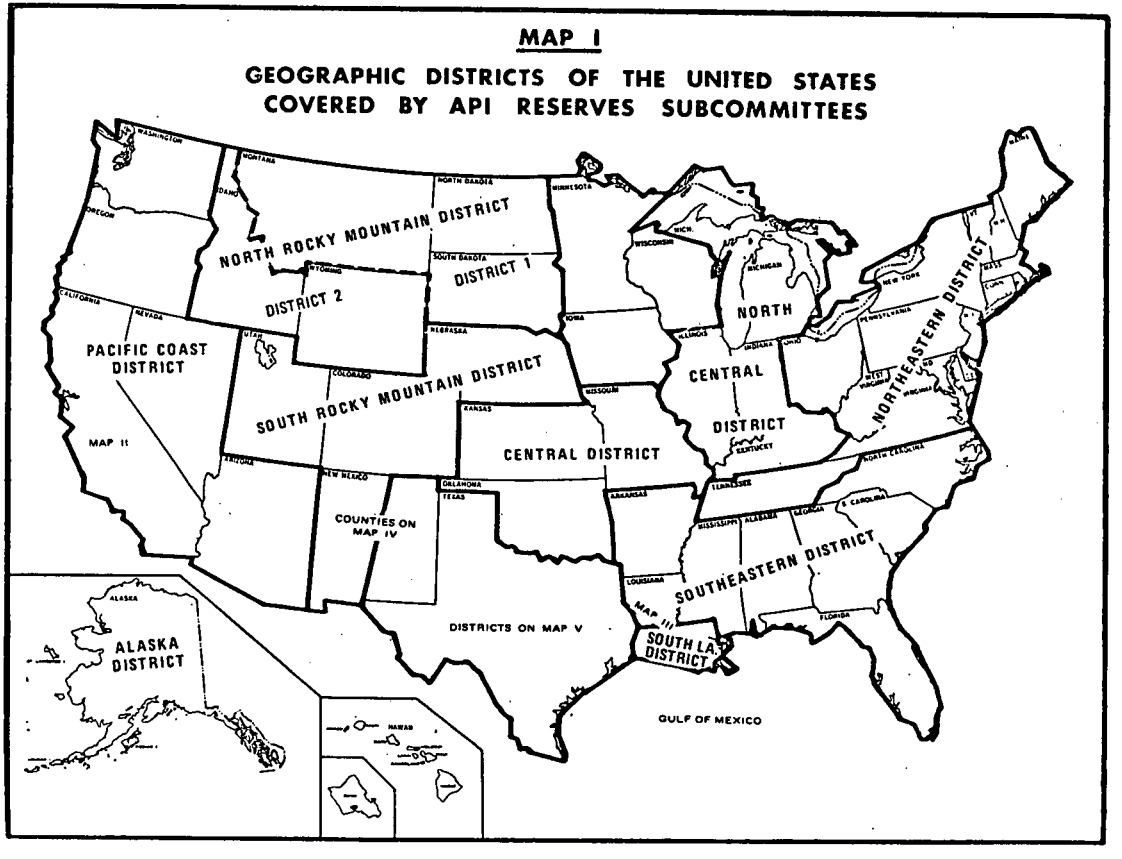
[2] Figures published prior to 1945 included proved reserves of cycle-plant and lease condensate and are omitted since they are not on the same basis as the series beginning in 1945.

[3] For all currently productive and depleted fields according to the year of discovery; based on proved reserves, cumulative production, and original oi-lin-place as estimated at Dec. 31, 1972. New pools of exploratory significance are assigned to the year of actual discovery; other pools are assigned to their fields' discovery year.

CHART I

PROVED RESERVES OF CRUDE OIL IN THE UNITED STATES, 1945-1972




MAP I
GEOGRAPHIC DISTRICTS OF THE UNITED STATES
COVERED BY API RESERVES SUBCOMMITTEES
NORTH ROCKY MOUNTAIN DISTRICT
DISTRICT 1
DISTRICT 2
PACIFIC COAST DISTRICT
SOUTH ROCKY MOUNTAIN DISTRICT
CENTRAL DISTRICT
NORTH CENTRAL DISTRICT
NORTHEASTERN DISTRICT
SOUTHEASTERN DISTRICT
SOUTH LA. DISTRICT
ALASKA DISTRICT
MAP II
COUNTIES ON MAP IV
DISTRICTS ON MAP V
MAP III
GULF OF MEXICO

Analysis of Salient Issues Regarding the Estimation of Proved Oil and Gas Reserve Figures*

PREFACE

Consideration of oil and gas reserve figures has become an important aspect of congressional study of energy policy needs. Not everyone agrees on the definitions of "reserves"—as contrasted to "resources"—and confusion exists concerning methodologies of estimation and reporting. There has been increasing criticism, on technical and policy grounds, of reserve estimates released by industry and trade associations. Legislation has been introduced which would require full disclosure of industry "internal" reserve estimates. Other proposals call for the establishment of some agency in the Federal Government to prepare and publish standards, validated figures on oil and gas reserves as the basis for formulating national energy policy and related fuels programs.

The study which appears on the following pages is designed to define and analyze a number of the salient issues associated with the above-stated problem within the appropriate historical perspective. The study utilizes current examples where oil and gas reserves are either at issue or are used as a basis for future projections. The last part of the study investigates the issue of "credibility" and whether "proved reserve" figures can be relief upon for the purposes intended. Finally, the authors suggest a number of alternative methods by which statistical data on reserves can be utilized for determining a sound national energy policy.

This study was conducted by Energy Research, Inc. for the Congressional Research Service of the Library of Congress under CRS Contract No. 1036.

II. THE ESTIMATION OF RESOURCES AND RESERVES

It is apparent that, as time goes on, more is known about a reservoir, and estimates of oil and gas present can be made with greater precision and validity.

When an untested area of marine rocks is to be initially explored, the only basis for estimation is the estimated volume of the marine rocks to producible depths; perhaps some surface geological information on the rocks and the structural features; and analogies with better known but apparently similar areas.

As more is learned, the geologist can build a concept of the number, size, and distribution of reservoirs, porosities, permeabilities, content of gas and oil, nature of the crude, reservoir pressures, and the like. Fairly precise estimates can then be made of the oil and gas that are likely to be produced and over what time interval.

The nature of reservoirs

The characteristics of an oil and gas reservice, and the care with which it is produced, determine to a large extent the proportion of the oil and gas originally in the reservoir that can be recovered. The percentage of the oil may range from about 15 percent to about 75 percent. Around 35 percent is often used as a good average. The proportion of gas that can be recovered is much higher; an average figure may be about 80 percent.

The rate of production is also important. If oil and gas are produced too rapidly from a reservoir, favored channels are developed in the reservoir toward the wells, the water below the oil may drive it too rapidly and unevenly, and the full yield of the reservoir is not attained. Some reservoirs are much more sensitive than others to rate of production in terms of amount of final recovery. In general about one-eighth of the producible oil in a reservoir may be withdrawn in a year. The corresponding figure for natural gas is about one-twelfth.

---

*Extract of pp. II, 5–57, 71, 72, and 76–80, study by Energy Research, Inc., dated Nov. 13, 1973.

Production from a reservoir using its own energy—gas pressure, water pressure, or both—is primary production. Later it may be desirable to stimulate the drive by the injection of water and/or gas at appropriate points into the reservoir, resulting in secondary production.

Unitization

Normally the oil rights to a reservoir are owned by more than one individual or company and in most cases by many parties. It is evident from the foregoing that the management of production from a reservoir should embrace the whole reservoir, not just parts under individual ownership. In many cases, the various owners will get together and agree on a unit plan for operation of the serervoir. One of the owners generally is designated the operator. The costs and returns are divided on the basis of the proportional ownership agreed on in the unit plan.

Most states today have enacted statutes that require unitization of a petroleum pool when proper conservation practices require it. Some of the older oil-producing states, such as Texas, encourage the voluntary unitization of fields, but do not authorize their regulatory agencies to require it.[1]

History of reserve estimates

In 1915, Ralph Arnold, a geologist, prepared an estimate of crude oil reserves. Similar estimates were prepared by the U.S. Geological Survey in 1916 and 1919. For the year 1922, estimates of crude oil reserves were prepared jointly by the U.S. Geological Survey and the American Association of Petroleum Geologists. Estimates of crude reserves were prepared by the American Petroleum Institute (API) in 1925, and estimates for 1927 and 1933 were made by the Federal Oil Conservation Board.

The petroleum reserves of the United States have been systematically reviewed and reported on an annual basis by industry technical groups since 1936. Initially, the estimations were made by the Committee on Petroleum Reserves of the American Petroleum Institute, and were limited to reserves of crude oil, including lease condensate.

The Committee on Natural Gas Reserves was formed by the American Gas Association (AGA) in 1946 for the purpose of preparing annual estimates of reserves of natural gas and natural gas liquids. Since that date, the API and AGA committees have worked cooperatively, and now issue a combined annual report.

Display of mineral resources

The U.S. Geological Survey has devised a way of displaying estimates of mineral resources, including oil and gas estimates, that is remarkably simple, flexible, and useful.[2] A roughly scaled rectangle represents the resource. The rectangle in its simplest form is divided, and scaled into two columns—the left one called *Identified* and the right one *Undiscovered.* The rectangle also is divided horizontally into a top part and bottom part, also scaled. The top row is labelled *Recoverable* and the bottom row *Submarginal.* This concept can be used by legislative bodies in consideration of policy formulation by legislation, as is explained in figure 1 on page 148.

The vertical scale is feasibility of economic recovery, increasing upward. The horizontal scale indicates degree of certainty of the estimates, increasing to the left.

Thus the upper left block of the rectangle will show *identified recoveragle* resources of the commodity depicted, such as oil or gas, to scale. The lower right block will show *undiscovered submarginal* resources. The user can draw a line across the diagram starting somewhere along the left vertical line, rising upward to the right until it intersects the top line. Everything above the line can be chosen by the group considering policy as representing resources to be included in policy-making; everything below the line can be excluded. The position and slope of the line can be debated by the group and drawn in any agreed-upon location.

Footnotes on page 169.

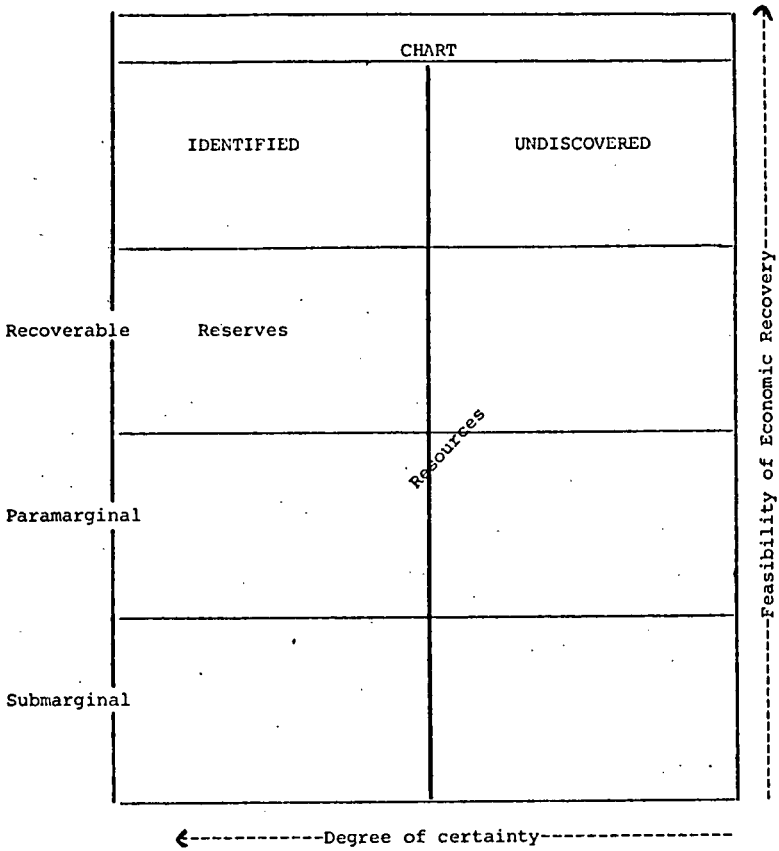


Figure 1. Conceptual diagram for the classification of mineral resources. From McKelvey (1972).

U.S. and foreign practices in regard to resource estimates

Two other points remain to be covered. The first pertains to the comparison of U.S. reserve estimates to estimates in other countries. No significant differences in ordinary practices are discernible. In many instances U.S. estimates are based on more and better data, but there seem to be no differences of significance in definitions used or in methodology.

Hendricks has pointed out that "the United States has been drilled for oil and gas far more intensively than any other large and geologically diversified areas in the world. Consequently the results of this drilling should provide the most meaningful statistical sample for appraising possible ultimate potential."[3]

The second point involves consideration of the methods of estimating oil and gas reserves with methods utilized in determining the availability of other mineral resources. The process of estimation in the oil and gas industry is significantly more difficult than is the estimation of most other mineral resources, including coal.

The estimation of metallic ore bodies and of other fossil fuels like coal or oil shale is different in many respects. The latter materials are solid bodies that are sometimes exposed at the earth's surface or in underground openings. Their physical and geometric characteristics and their geological relationships can be studied by direct observation.

Footnotes on page 169.

Oil and gas, on the other hand, are fluids that were collected in underground reservoirs which are never directly observable. Their presence in reservoirs is in fractures and pore space, and they move during development. Furthermore, they are present in a much wider range of geological settings.

III. ECONOMIC ISSUES IN DEFINING AND MEASURING OIL AND GAS RESERVES

Despite the seriousness of the U.S. oil and gas position at this time, the exhaustion of domestic resources of these commodities is not indicated. The situation, among other things, reflects industry's inability to produce enough from proven reserves. In 1956, consumption had reached a level that would have required all possible domestic production, if the U.S. had not imported any oil. By 1972, U.S. production actually reached capacity. The U.S. is simply not finding oil and gas fast enough to provide the reserves required for increased production.

Although large quantities of oil and gas remain undiscovered in the United States, the outlook in the past few years has not been encouraging enough to stimulate sufficient exploration and discovery, particularly in erespect to natural gas. Hendricks in 1965 estimated that the amount of unexplored favorable rocks in the U.S. was about six times the amount already explored.[4] He also concluded that, in spite of the increasing cost of discovery, economic incentive in time would result in the exploration of at least one-third of the unexplored rocks, and that the incidence of oil found would be three-fourths as great for the presently explored rocks. This would result, if his predictions prove correct, in the discovery of about 600 billion barrels of crude oil. He concluded that "the petroleum industry can continue to explore for some time with a decreasing finding rate before reaching the limit of profitability."

Hendricks also presented a table that permitted the calculation of the follow- the decreasing amounts of oil found per foot of exploratory drilling: 1945—0.17 barrels per foot of drilling; 1950—0.14 barrels per foot of drilling; 1955—0.11 barrels per foot of drilling; 1960—.09 barrels per foot of drilling; 1965—.08 barrels per foot of drilling.

Of course, at some time the point will be reached at which the finding rate will no longer be profitable, but that point is still a long way in the future.[5]

The same general subject has been reviewed, with emphasis on some of the economic aspects and capital requirements, by the Chase Manhattan Bank.[6] Its report noted:

". . . much of the energy resources of the United States is not accessible within the current economic framework. To find, develop, and make available the energy the nation requires will necessitate the use of vast amounts of private capital. And if the capital funds are to be available, the price structure will have to be adequate. . . . Currently, less than 5% of the average family's annual income is devoted to energy—much smaller than the proportions used for food or housing or clothing or taxes.

"Clearly it is vitally important that the United States maintain the highest possible level of self-sufficiency in respect to its energy supply. And, if that goal is to be achieved, major changes are essential—there is no hope that it can be won as long as existing conditions persist. The restrictions that have stifled both the generation of capital and the incentive to invest must be removed at once."

Oil and gas a part of an energy system

Economic issues should loom importantly in the definition and measurement of oil and gas reserves and additions to those reserves, because of the importance of economic considerations in determining what kind of measures will be useful in making decisions about energy policy and because of the character of the present definitions and measurement processes. At present the official definitions of reserves for oil and gas set by the API and AGA read as follows:

"Proved reserves of crude oil (natural gas) as of December 31 of any given year are the estimated quantities of all liquids statistically reported as crude oil, which geological and engineering data demonstrate with reasonable certainty to be recoverable in the future from *known reservoirs under existing economic and operating conditions.*" [Emphasis added].

In theory, this definition is part of a complete system for measuring the raw material inventories of the industry as a whole and hence of the nation. In

Footnotes on page 169.

practice we do not know precisely how the system works. There are no quality control provisions or official descriptions of the system that would reveal what weight each set of factors are given in the actual course of the annual estimating sessions. Inditions are that geological and engineering considerations loom larger in the estimates than do economic assumptions.

Furthermore, this definition relates to oil and gas that can be recovered from *known* reservoirs. It does no tell anything about the availability of inventories of oil and gas from reservoirs that are yet to be discovered but which are assumed to exist in nature.

If geological and engineering factors are set aside in favor of concentration on the economic issues, the reserves problem can be conveniently analyzed in terms of the influence of economic factors at each of five stages in the production and use of energy, though it must be remembered that the system actually operates simultaneously rather than in parts or stages. These stages are:

(1) Demand for energy in total both in terms of the tasks or missions to be performed and the efficiency with which the energy is used.
(2) Choice between competing sources of energy.
(3) Desired levels of oil and gas inventories or reserves.
(4) Additions to inventories or reserves that can be achieved by further development of or more intensive exploitation of existing or known reservoirs.
(5) The rate at which reserves are added through discovery of new fields or reservoirs.

This brief sketch emphasizes that it is not the absolute level of oil and gas reserves that is important, but rather the relative size of those reserves or the ratio of reserves to current and prospective use. At present the common practice is to judge reserves in terms of their ability to support the current rate of use or production into the future. More important is their capacity to support prospective rates of use in the future when demand will be different than at present. In conventional terms, crude oil reserves have averaged about 12 years. Natural gas reserves were over 30 years' use at the end of World War II and were down to 11.8 years at the end of 1972, as use rose over the period faster than additions to reserves; but these ratios are in terms of use from domestic sources. If measured in terms of total use, including that demand now filled from imports, both these reserve ratios would be significantly lower. They would be still lower if measured in terms of future demand at current prices for each source of energy. This strongly emphasizes the fact that reserve figures acquire meaning only in terms of the *prospective* operation of the total system for producing and using energy including future trends in prices and costs of energy from all sources.

This suggests the first issue that economic analysis should raise: whether the measurement of oil and gas reserves should be part of a national system for the objective measurement of the current and prospective operation of the total system for the discovery, development, production and use of energy as a basis for the formulation of intelligent public and private policies. If so, then numerous changes would have to be made in the system as presently conceived and operated. For example, it would be necessary to collect better and more extensive data on prices and costs in each segment of the energy field so that the economic assumptions used in measuring oil and gas reserves could be made more explicit and uniform throughout the system. Also such data would be needed in order to guage the relative cost per unit of discovering new reservoirs of oil and gas, as compared to costs for finding and developing some alternative source of the same amount of future energy. Such a system also might force the standardization of the units of measurement on some units other than barrels or Mcf.

Consideration of oil and gas reserves as part of such a larger energy system indicates that these measurements can be affected by changes in economic conditions and policies which: (1) Alter the relative price or cost of oil and/or gas compared to those of other possible or actual source of energy: (2) Alter the cost of finding an additional quantity of reserves: (3) Reduce the costs of increasing the ratio of recoveries to total oil and/or gas in each reservoir: and (4) Alter the costs of transporting, processing and delivering a given quantity of energy from oil or gas or the cost in energy of performing a given end-use task. Most attention has been given to the costs of discovery as a factor in determining the size of additions to proved reserves, but the others mentioned could prove equally important in the long run.

To fully appreciate the significance of discovery costs or what MIT Professor M. A. Adelman[7] has labeled the "minimum economic finding costs" it is first necessary to outline a few other characteristics of oil and gas operations. First, these are joint products in two ways: (a) the two occur together in nature in proportions that cannot be predicted in advance of drilling and development; and (b) much of both products come jointly from the same wells in the same field. Second, the total quantity of oil and gas in the natural resource base is not known, so that at best we can produce only informed estimates of this larger total of which the known or proved reserves are only an unknown fraction. Third, oil and gas are but two of many varieties of hydrocarbons and these, in turn as noted earlier, constitute only part of a total energy resource system which includes such elements as nuclear, coal, solar, hydroelectric, and geothermal energy.

Finally, it must be kept in mind that the proved reserves as usually measured constitute only a part of the whole system of oil and gas energy supply which runs from the unknown total of all reservoirs in nature to the discovered or known reservoire to the proportion of the contents of these that can be recovered using present technology, equipment and costs to the efficiency with which oil and gas can be processed and transported to point of use, and at last depends on the efficiency with which the energy is used.

These considerations reveal why economists insist that decisions about public and private policy making must rest on a broader and more complex base of information than merely the proved reserves of oil and gas that have been the heart of so much of the policy controversies. For example, inventory analysis generally rests on some procedure for evaluating the optimal level of inventories in the light of the trend in demand, losses to be incurred if inventory proves inadequate to service actual demand in the predictable future, the costs of holding inventory per unit, the time period necessary to order and bring into being added output, and the probable trend of costs and prices over the future period for which plans are being made.

In the case of oil and gas, it is generally realized that costs of holding oil and/or gas in the ground for long periods is likely to prove very high by typing up large amounts of capital, and that discovery is an uncertain process so far as any short time period is concerned. Hence we find that oil reserves have been fairly stable at an average of about 12 years' próduction with a range since World War II of between 9.3 and 13.6 years' supply. Apparently this has been about the amount that costs and rate of discoveries would permit. If economic conditions or economic incentives provided by public policies were to reduce the costs of discovery or of holding reserves relative to the prices received for oil, then reserves probably would increase. It would take a much larger change in the relationship of gas prices to costs of discovery or holding to produce a similar result, however, due to the problem of joint costs and joint occurrence.

It is worth noting that present incentives provided by public policy are aimer *at encouraging production and use, and are not incentives directed specifically to the discovery and holding of reserves.* Indeed they are not incentives to improve efficiency in the use of energy, including that derived from oil and gas, which could make large differences in the significance of any given total of proved reserves of the various fuels.

Any examination of the past record on new discoveries suggests that changing economic conditions have a significant impact; in the case of additions to proved reserves from revisions and extensions, the record is surprisingly bleak, however. Changes seem mainly to reflect geological and engineering considerations or the accumulation of knowledge about already known fields combined with the correction of mistakes of a clerical or statistical character in the previous estimates. Should these revisions and extensions reflect cyclical changes in costs and prices or should the estimates be related to longer-run trends in prices and costs? If the latter is the case, then does this imply that estimates must take into account future prices and costs, and not merely present values as is the current practice?

This analysis also suggests that reserve data for oil and gas may have quite different meanings and may even behave differently if inflation becomes the permanent expectation. In a growing economy, in which incentives such as depletion and investment credits shift part of the costs of the industry to the public through the tax system rather than through the price system to the users and investors, inflation may seriously alter the operation of the industry

Footnotes on page 169.

compared to its performance in a world of reasonably stable prices—particularly if inflation is accompanied by a permanent system of price controls that shifts part of the costs of the inflationary monetary and fiscal policies from users of oil and gas to the workers and investors in these industries. It is easier to set up controls over prices than over output and costs. What happens? An incentive to maximize reserves in ths ground? New discoveries? Or a rush to exploit reserves as fast as possible?

Costs of capital and optimum resources

This is an appropriate point to consider briefly the frequently raised issues concerning the cost of capital, and the optimum ratio of reserves to production. Given the present tax laws and the typical arrangement between the owner of the land or mineral rights and the exploration and development company, there exist strong incentives to raise production to high rates from successful drilling and hence to produce a low ratio of reserves to production. Other considerations, already enumerated, push the companies in the direction of longer planning periods—that is, in the direction of larger ratios of reserves to current production. Where the outcome falls depends in part on the cost of capital tied up in these reserve holdings over time. If interest rates are low, as after World War II it may pay to extend holdings; while if inflation raises capital costs in money terms, as in recent years, one might expect to see companies shortening up the ratio of reserves to production. Interestingly enough that appears to be the case, which hints, though does not guarantee, that in a time of reasonably stable prices and relatively low cost of capital, reserves would eventually move up relative to production. On the other hand, if one expects inflationary price increases in the future, why not increase reserves to be able to profit from subsequent price increases? Is it the real cost of the money cost of capital that is decisive; What is the role of price control uncertainties; How do they affect price expectations;

These observations and issues regarding the possible effects of the costs of capital on holding periods in oil and gas must be modified in two directions. First, since these are joint products, the chain of causation is more complex than usual and changes in costs may have different effects according to whether they affect both products equally, or in some other ways, because of the joint but unpredictable character of occurrence in any particular case. What this amounts to in practice is that changes in costs in general, as well as changes in the costs of capital, can have differential effects on oil as compared to gas or gas liquids without the exact nature of these differences being predictable.

Further, since these are wasting assets as far as any one well or reservoir is concerned, it follows that if a company is to maintain a steady flow of output to its customers, it must over time increase its reserves by extensions, improved recovery methods or new discoveries if it is to avoid running out of supplies at some future time. This is true even in the case of a mythical company with a stable demand, since the additions would be needed to offset exhaustion of old wells or reservoirs. This again emphasizes the importance of viewing these proved reserves as only part of an ongoing system where new discoveries, extensions, changes in technologies, changing use patterns, and changes in relative costs and prices of all energy sources, all play roles in giving significance to any reported level of reserves.

The API/AGA effort recognizes the importance of economic factors in estimating proved reserves. In the definition of such reserves "existing" economic conditions are assumed to continue into the future as these deposits are developed and produced. Nevertheless, it should be noted that the appraisal of "existing" economic conditions often lies in the eyes of the beholder. Consequently, if the effect of economic conditions on reserve probabilities is to be assessed by those who use these API/AGA data, the detailed assumptions used by the estimators should be explained. Conferences with API and AGA personnel have established that uniform assumptions are not developed and those who prepare estimates for each field/reservoir are expected to use their own judgment in applying the economic limitation on reserve estimates.

IV. RESERVE ESTIMATES

Oil and gas are non-renewable commodities. For all amounts that are produced, that much less remains in the ground. Oil and gas influence virtually all human activities. Therefore, it is most desirable to have available reserve esti-

mates in many categories, a number of which have already been mentioned in this report.

Reserve data are needed by industry to predict amounts and costs of future production, to devise and execute exploration and development plant, to assist in pricing, to make distribution plans, to provide for storage and transportation facilities, and for many other purposes. Such data are needed by government to formulate national plans for adequate energy supplies, for tax purposes, for economic prediction, and for regulatory purposes to name a few. Economists need reserve data for development plans, for capital requirements, and for estimates of fiscal income.

Such data are of little significance, if their meaning and interpretation are not understood. A common fallacy among those not familiar with the industry and its terms is to equate *proved reserves* with *petroleum resources*. Proved reserve estimates are more like bank accounts. At a given time the proved reserves are analagous to the bank balance. Both additions (deposits) and use (withdrawals) are contemplated.

Because oil and gas in the ground are not subject to actual viewing, it has been traditional to be very conservative in estimating undiscovered oil and gas resources. Actually discoveries repeatedly have far exceeded estimates made a few years earlier. This occurrence is so common that it approaches a rule. Similarly, estimates of production from identified deposits have generally proven to be much too low, and must be revised upward sharply as time goes on. This tendency, and the reasons for it, must be grasped by policy makers.

The principal additions to reserves are extensions and revisions of earlier estimated reserves of fields discovered in earlier years. For example, in 1960, extensions and revisions of estimates of fields discovered through 1936 were almost twice as much as the estimates made in 1936.

For the Western Hemisphere the proved reserves in 1962 were on the order of 70 billion barrels, while total production through that year was about 110 billion barrels. Ten years later, in 1972, cumulative production had reached approximately 160 billion barrels. In spite of the roughly 50 billion barrels production in the ten-year interval, reserves had climbed to just under 90 billion barrels.[8]

A recent example of the principle that has been described is afforded by the Swanson River Field, Alaska's first significant oil field.[9] That field was discovered in the 1950's and, at the time, it was estimated that it would yield 50 million barrels. By the end of 1972 it actually had produced more than 118 million barrels, and the field in still far from exhausted.

In an attempt to apply the principle to a current situation—the Prudhoe Bay area of northern Alaska—J. C. Reed of The Arctic Institute has prepared a scenario as to what he calculates the Prudhoe Bay region might yield through the year 2000.[10]

In 1973, the proved reserves a Prudhoe Bay were estimated at 10 billion barrels. Reed estimated that 43 billion barrels would be found by 2000. His scenario has the Alyeska pipeline starting to carry oil in 1978, a second pipeline to the central U.S. beginning to operate in 1982, and supertankers beginning to carry additional oil to the East Coast through the Northwest Passage in 1995.

By 2001, a total of 26.56 billion barrels of oil would have been produced, and the North Slope would then be believed to have a remaining reserve of more than 35 billion barrels, according to Reed.

Reserve estimates may be subject to distortion, deception and perhaps even fraud, from time to time, since reserves often have a direct relationship to the availability of capital.

Basic units being measured; precision considerations

The basic units from which an energy (gas and oil) reserve estimate is derived are fields, pools, reservoirs, etc. of oil, gas, or a combination of both. In many social (population, employees) industrial (establishments, production), of economic (wages, prices) surveys, the basic units can be readily defined and consistently identified. They may be visually identified (characteristics of a person or members in a family), may have been previously recorded (production records, payroll records, personnal summaries), secured from related records using some judgments, or may be known by the respondent. The reporting or quantification of the desired information is fairly straightforward and is accompanied by a relatively small margin of uncertainty resulting from lack of

Footnotes on page 169.

information about the desired item and/or judgments involved in its recognition (or measurement). This differs from sampling differences or procedural errors when combining the inrividual readings into an overall total.

The basic unit upon which energy reserve estimates are based have markedly different characteristics. For relatively new discoveries, the characteristics of fields, reservoirs, pools "proved" by sample borings in areas selected as being promising can only be estimated from the structure and shape of the geological formation as revealed by the few sample borings. Such estimates of hidden basic units depend on judgment and can be expected to be accompanied by a large amount of uncertainty. Different experts and different samples can result in differing estimates of the same unit being measured. Additional samples (or actual production readings) help to define the field, pools and reservoirs more precisely and reduce the uncertainty about the size and shape of the resource. Uncertainty still remains and will continue to remain, however. The basic unit being measured, by its very nature, will remain not visible. Its general relineation and description are developed from interpreted associated readings which, over time, contribute more information, but can never completely describe or reveal all the characteristics of the unit being considered. This results in a potential for large variations and uncertainty in the estimates.

Added to this measurement problem is the definition of the estimate desired, e.g., "proved reserve". The API and the AGA use a current inventory approach to oil and gas reserves—how much gas and oil can, with reasonable certainty, be expected to be recovered (in the future) from known reservoirs under existing economic and operating conditions; The definition uses judgment to bridge the gap between the unseen, highly variable estimate of the resource in the ground and the desired estimate of the amount to be counted in the proved reserve estimate. This process is subjective and is accompanied by variability depending on the character of the personal judgments being made.

The characteristics of the petroleum basic units and the processes used to arrive at "proved reserve" estimates should be kept in mind when the methods of developing the reserve estimates are described later and the precision of the estimates are discussed.

The methodology of reserve estimates

In general, reserve estimates are made by use of a geological method, a mathematical method, or, as in most cases, by a combination of the two with differing emphasis on one or the other. Both methods employ statistical records of exploration and production, but the mathematical method relies very largely on statistical records.

Estimates of different authorities that emphasize statistical records are more likely to be comparable than estimates that emphasize geological interpretation. Statistical data are hard and firm, although considerable latitude is evident in how those data are used. Geological interpretation, on the other hand, is largely a matter of individual judgment, and estimates employing a good deal of geological interpretation may differ markedly.

In the pattern of depiction of oil and gas resources employed by the U.S. Geological Survey (described earlier), the identified recoverable resources that are designated by the upper left block (see fig. 1) are more suitable to the mathematical method of estimation because more specific data are available. The geological method becomes increasingly applicable both downward and to the right, and is the only method applicable in the lower right block—undiscovered submarginal resources—because there are virtually no hard data for that block.

In general in the United States the estimates for the upper left block—identified recoverable resources—have been provided only by the API and the AGA. Other groups, especially the U.S. Geological Survey, National Petroleum Council, and the Potential Gas Committee are more active in regard to the other three blocks (upper right = undiscovered recoverable; lower left = identified submarginal; and lower right = undiscovered submarginal).

As to the actual process of estimation in regard to the upper left block of the Geological Survey's method of showing resources—the identified recoverable block, where the data most nearly adequate for precise estimation—ordinary laws of physics, mathematics, and fluid mechanics are applied. In a typical case, for a well explored, well developed field with a long history of production, many sound data are available on dimensions, retailed stratigraphy, geologic struc-

ture, rate of production, change of pressure with time, porosity, permeability, rate of encroachment of water, and the like.

An oversimplified analogy may be useful. If a small rubber balloon, the size of a pink pong ball, is inflated to a given pressure and then punctured with a tiny hole, the pressure will decrease rapidly. If it were possible to inflate to the same pressure a balloon the size of a city block, and then puncture it with the same size hole, it is obvious that the pressure would decrease very slowly. This phenomenon occurred about three years ago, when an exploratory well in the Canadian Arctic Islands penetrated a high-pressure gas reservoir, blew out of control and caught fire, and flowed through an open hole for many months with virtually no change in pressure before it could be brought under control and shut off.

The most widely used series on reserves are those prepared by the American Petroleum Institute and the American Gas Association. The Federal Power Commission conducted a comprehensive survey of gas reserves as of the end of 1970 which can be compared with the AGA estimates. The method used by each to develop their estimates are described in this section.

1. American Petroleum Institute (API) :

In 1966 the API assumed responsibility for setting standards for the statistical reporting of petroleum industry operations in the U.S. The API is structured to cover all aspects of petroleum statistics, one of which is estimating crude oil reserves. The relation of "reserves" is the overall petroleum industry statistics endeavor is presented in Appendix A, Organization of API Statistical Services.

The Committee on Reserves and Productive Capacity has the primary responsibility for preparing annual estimates of crude oil reserves in the U.S. The members of the Committee and its chairman are appointed by the Chairman of the Committee on Statistics, initially for a two-year term. Appointments are usually renewed as long as members retain an active and participating posture. The Director of the API Division of Statistics serves as Secretary of the Committee. The Federal Government is represented by a designated observer (or his alternate).

Each member (except the Secretary) is assigned a specific area of the U.S. for which he assumes the responsibility for preparing the estimates of its oil reserves. The member establishes one or more subcommittees composed of qualified technical personnel to develop estimates of the districts in his area. The subcommittee members are appointed for a one-year period, but membership is usually retained so long as there is active affiliation with the petroleum industry which enables the subcommittee member to carry out the subcommittee's work. Estimates are prepared for individual reservoirs or fields. Such information is usually considered highly confidential by companies owning the reserve and an estimate developed by a subcommittee member is based on his own company's data, from similar information received from other operators in the field on a strictly confidential basis, and on information he can secure from other related sources (scouts, lease brokers, etc.). For newly discovered or early stage of development fields, reserve information will be highly secret because of leasing possibilities and the subcommittee member may find it extremely difficult to secure information anr may have to resort to informed guesswork. For developed fields, the estimate is based on production information, well logs, core sample reports, etc. and the estimate become more accurate.

An estimating manual [11] defines the—geographic areas for which estimates are to be prepared; coordination in reserves estimates work being compiled by API and AGA subcommittees; policy on confidentiality of information and records; schedule of meetings for the presentation of reserve estimates; definition of terms; information—type to be prepared; and relationship among data published.

To summarize, reserve estimates are developed at the local level for individual reservoirs/fields by subcommittee members using confidential information and following a recorded set of standard definitions. Individual interpretation and judgment are exercised but the continuing nature of the membership tends to result in continuity in the estimates over time. The level of reserve estimate, however, may be affected when a change in membership occurs. Since turnover in membership is not great, such differences will be difficult to observe unless they are very large. The estimates for an area are assembled and are reviewed at the subcommittee level (meeting). The member of the main com-

Footnotes on page 169.

mittee having the responsibility for an area, is expected to make sure that each of his subcommittees is staffed properly and that the work is performed in accordance with the procedures established by the committee. The estimates are then assembled for presentation and review at a full committee meeting. Questions may be raised and referred back to the subcommittee, where adjustments to the estimates can be made. Referral to the subcommittee for adjustment of an estimate stems from the availability of data at the local levels its confidentiality, and the need for personal judgment and interpretation at the local level of estimation. Technical Report No. 2, cited previously, specifically states that "The professional judgment of the Committee members, as reflected in the development of estimates of crude oil reserves and productive capacity, is recognized and preserved without modification by higher authority or other committees within the Institute." Thus, the process of estimating reserves at the local level by technical personnel is recognized as the most accurate method.

For the 1972 estimates, the API Committee on Reserves and Production Capacity was composed of 15 members, of whom 13 were associated with major oil producing companies, one with a state geological survey, and one on the API statistics staff. The work was carried out by 159 members, of whom 22 were subcommittee chairmen and vice chairmen. The reserve estimates were published in the annual publication of the API which contains oil and gas data for the U.S. and Canada. The data for the U.S. are presented by category (revisions, extensions, new field discoveries, new reservoir discoveries, etc.). The state data, however, do not show the same amount of detail because of the confidential nature of the basic data used and the possibility of disclosing information about a single company.

2. American Gas Association (AGA):

The AGA is one of the principal sources for consistent U.S. gas industry statistics. As part of its overall program, a Committee on Natural Gas Reserves was established to prepare annual estimates of gas reserves in the U.S. the Committee derives its authority from, and is responsible to, the Board of Directors of the Association.

The Chairman of the Reserves Committee is appointed by the AGA President on behalf of the Board of Directors of the Association. The Secretary of the Committee is a staff member of the AGA and is a member of the Reserves Committee. A representative from the U.S. Bureau of Mines is an ex-officio member of the Committee. Other Committee members are appointed by the chairman. They are assigned geographic areas of responsibility. Each Committee member maintains an organization of an area subcommittee composed of qualified technical personnel who compile and report the desired necessary gas reserves and other related data. Committee procedures and guidelines are followed in the preparation of the data which, after compilation, are forwarded to the Committee member responsible for the area. The information is incorporated into the Annual Report of the Committee.

Membership on the Committee and Subcommittee is retained so long as assignments are properly carried out and each individual is expected to serve only as long as he retains affiliation with the oil and gas industry in an active capacity. Subcommittees are required to maintain records for reserves on a reservoic and/or field total basis as required to adequately support the composite statistics reported. Subcommittee members have available well formation and production data accumulated from many sources and compiled in company records. They also have access to confidential studies in their own company files to support their determinations by reservoir and field. Such information is proprietary in nature and is confidential.

The annual report, issued jointly with API and the Canadian Petroleum Association, defines the geographic areas for which estimates are to be made, policy on confidentiality of information, schedule of meetings, coordination with API Committee on Reserves, procedures, and definition of terms.

The organizational structure, mode of operation, and definition of terms follow closely those of the API. The definitions of gas industry terms appear in Standard Definitions for Petroleum Statistics, Technical Report No. 1, published by the API. In general, the same concepts of reserves are followed by AGA and API. A manual describing in detail the estimation process to be employed (similar to API Technical Report No. 2) is not available.

For the 1972 estimates, the AGA Committee on Natural Gas Reserves was composed of 14 members, of whom 12 were associated with gas transmission or

producing companies—five of these represented major oil companies (Texaco, Gulf, Exxon, Mobil and Shell)—one with central office (AGA), and one with the Federal Government (U.S. Bureau of Mines). Of these 14 members, 10 were subcommittee chairmen responsible for developing the area totals. The detailed estimating work was carried out by 99 subcommittee personnel under the guidance and supervision of the 10 chairmen. The reserve estimates were published in the annual API-AGA publication which presents oil and gas data for the U.S. and Canada.

Gas reserve estimates are built up on a field-by-field basis using raw data from company files. Such data are confidential. Also, the amount of effort a subcommittee member can contribute is limited (time he can contribute from his official duties or free time) and he may tend to use the most readily available source upon which to base his estimate. For established producing oil wells, there is usually a body of supporting data and estimates are expected to be reasonably accurate. For newly discovered fields, the estimates may be subject to greater uncertainty because of the combination of paucity of information and the limited time that may be available. Because the estimates are prepared on a field basis using raw data, reviewing the estimates at the subcommittee level (or above) becomes very difficult and is usually limited to a few cases of large variation from expected results at a subcommittee meeting. The individual field estimates are summarized at the area level and the area summaries are presented to the main Committee for general review and consolidation into the tables for the annual report. Detailed field information remains at the area level. However, subcommittee personnel are invited to attend the Committee meetings during which the area estimates are presented.

The AGA has been publishing estimates of natural gas reserves since 1946. In 1966, following the recommendations of the Bureau of the Budget Petroleum Statistics Report (March 1965), the AGA expanded its statistics. Revisions to estimates at the national level were reported separately (previously they were combined with extensions), and additional detailed tables were incorporated into an enlarged annual report, as well as a short description of the organization, definitions and procedures used in developing the gas reserve estimates.

A more detailed statement of the definitions of gas terms used in petroleum statistics appears in Technical Report No. 1, *Standard Definitions for Petroleum Statistics*, released in 1969. The definitions were coordinated with those for crude oil terms and the concept of "proved reserves" is consistent with the one used by API.

Federal government representation at the Gas Reserves Committee meetings was provided by naming an official of the Bureau of Mines as a member.

The basic methodology of synthesizing a total U.S. gas reserve estimate by summing estimates for individual fields has not been changed, nor has a quality check been made of the adherence to instructions when field estimates are developed.

A measure of the overall accuracy of the reserves estimate became possible with the completion of the 1970 gas reserves study conducted by the Federal Power Commission. (See Chapter V.) The AGA 1970 reserve estimate was slightly less than 10% greater than the FPC estimate. This is within acceptable limits where sampling and non-sampling errors (variations) are considered. However, the FPC study found, "In certain fields, the reserves found by the FPC reserves estimation team were substantially less than those reported by AGA. It appears that such AGA reserve estimates were based on recovery factors which were too optimistic. The recovery factors did not seem to have been revised to reflect later information relating to field performance." [12] The nature of the AGA estimating process limits the personnel time that is available. This results in the possibility of continuing faulty prior estimates. However, it appears unlikely that operating records for large producing wells would be overlooked. An FPC finding of deviation can be expected whenever a strictly controlled sample survey duplicates a parallel system which is not as strictly controlled and has a more stringent demand on time (availability of time of personnel to cover all fields).

V. USE OF PROVED RESERVE FIGURES UTILIZED IN CURRENT STUDIES

The best manner in which to view the use of "proved reserve" figures gathered by API and AGA is to analyze their use in current studies. Two such studies are available. The first is entitled the "National Gas Reserves Study"

Footnotes on page 169.

and was conducted by the Federal Power Commission (FPC) to develop an independent estimate of the total proven gas reserves in the U.S. as of December 31, 1970. The second is a report entitled, "U.S. Energy Outlook" which was prepared by the National Petroleum Council (NPC) in response to a request from the Department of the Interior to project the energy outlook in the Western Hemisphere into the future as near to the end of the century as fasible with particular reference to the evaluation of future trends and their implications for the United States.[18]

1. Natural gas reserves study

A gas reserves analysis program was initiated by the Federal Power Commission for the purpose of compiling data on the Nation's natural gas reserve. The first step of the program was the National Gas Reserves Study (NGRS) as set forth in an order dated December 21, 1971, which described procedures, operational units, and specifications for the study.

The study program was designed to yield an independent estimate of the total proven gas reserves in the United States as of December 31, 1970. The scope of the NGRS was limited to estimating the magnitude of the proven reserves but not an analysis of deliverability. Also, no estimate of total gas resources nor forecasts of future discoveries were to be made and gas volumes not then economically producible were not to be included, even if new technology could be expected to lead to their recovery.

Although there are many sources for data on gas reserves, only one has provided a continuing comprehensive estimate for the United States. This is the one prepared by industry specialists working through the AGA Committee on Natural Gas Reserves (previously described). The NGRS undertaking was to be an independent government study producing an objective analysis of gas reserves. It required the application of: (a) sound statistical techniques; (b) accepted petroleum engineering, geological, and economic practices; (c) recognized accounting (summarization and control) principles; and (d) modern computer processing methods.

A complex structural organization was outlined to permit the interplay of the different requirements: Nomenclature problems were resolved by the FPC staff, a comprehensive list of all gas fields was compiled by the Oil Information Center (OIC) at the University of Oklahoma Research Institute, reserve teams composed of FPC geologists and other professional staff members made estimates of reserves by field, with assistance from the U.S. Geological Survey (Outer Continental Shelf Fields), United States Department of the Navy, and from colleges and universities, an independent private industry accounting firm (Accounting Agent) was selected by FPC to provide security for the individual field reserve estimates, and to do the necessary classification and tabulation work, and a team of government and academic experts (Statistical Validation Team) was named to prescribe sampling procedures for developing valid estimates of reserves.

The study and analysis involved the following major activities:

(a) The total gas field population was delineated together with their nonassociated and associated gas reserves.

(1) Lists of gas fields and their reserves were submitted by AGA to the Accounting Agent for compilation and transmittal to the OIC.

(2) The OIS developed a list of gas fields based on data available in its Petroleum Data System file and compared it with the testing of AGA fields compiled by the Accounting Agent. This resulted in a gas field population list that was a complete and accurate (no duplications) as possible.

(b) A list of fields for which independent reservoir-by-reservoir reserve estimates were to be made was selected from the complete population list by statistical sampling.

(1) The Accounting Agent provided the Statistical Validation Team with distribution or stratification of gas fields needed for the development and selection of a statistically sound sample.

(2) The Accounting Agent then selected the sample following instructions of the Statistical Validation Team.

(3) The selected sample of gas fields, augmented by all "AGA omitted fields" (as noted by OIC) made up the list of fields for which the independent estimates, reservoir-by-reservoir, were to be made.

(c) The FPC reserve teams developed the gas reserve estimates for the fields selected.

Footnotes on page 169.

(1) The supervisor of the field teams scheduled reserve team visits to the different companies involved.

(2) Companies furnished work space, facilities, and the primary data needed.

(3) The reserve team decided on the types of reserves calculation techniques to be followed.

(d) Results were transmitted to the field team supervisor on a confidential basis.

(1) The field team supervisor compared his team's estimate with the AGA estimate for the corresponding field. At his discretion he could request a re-check of the work of a reserve team, or a re-examination of the data by a reserve team of his choice. A final estimate for each field was transmitted to the Accounting Agent.

(2) The Accounting Agent, following procedures established by the Statistical Validation Team, used the FPC field team results and the AGA reserves data to develop statistical parameters.

(3) The FPC, through an agent, prepared an estimate of dissolved gas reserves and forwarded to the Accounting Agent.

(4) The National Gas Survey Staff prepared breakdowns of proven gas reserves for various categories desired.

This complex process, following scientifically and technically accepted practices under strictly controlled conditions, resulted in an independent estimate of gas reserves which differed from the AGA data, as follows:

TABLE 1.—COMPARISON OF AGA AND FPC ESTIMATES OF PROVEN RECOVERABLE GAS RESERVES IN THE UNITED STATES AS OF DEC. 31, 1972

[Volumes in billions of cubic feet]

Category	FPC		AGA	
	Reserves	Percent of total	Reserves	Percent of total
Nonassociated gas	189,546	72.45	204,098	71.18
Reported fields	189,440	72.41	204,098	71.18
Omitted fields	106	.04		
Associated gas	39,047	14.92	47,923	16.71
Reported fields	39,044	14.92	47,923	16.71
Omitted fields	3	0		
Dissolved gas	33,050	12.63	34,721	12.11
Total	261,643	100.00	286,742	100.00

The statistical estimate of gas reserves is 261.6 trillion cubic feet (TCF). The reliability of the estimate was determined to be within 10% with a high degree (95%) of confidence, considering only the statistical procedure for extrapolating the sample field reserves to a total reserve estimate.

The characteristics of the gas fields being measured, and the variability of estimating proven recoverable reserves under stated conditions of "reasonable certainty of recovery under existing economic and operating conditions" involve judgment decisions. Therefore, an additional uncertainty factor is introduced (apart from the statistical process uncertainty). The Statistical Validation Team has judged that the calculated sampling error and the measurement error possibilities are of the same order of magnitude; sampling of additional fields would not greatly improve the reliability.

Among the more important findings of the study are:

AGA field lists are essentially complete. A total of 62 "AGA omitted fields" were identified, but their total reserves were less than 0.1 percent of the AGA total.

Gas reserves estimates can be made on a reservoir-by-reservoir basis using selected teams.

The FPC and AGA estimates of gas reserves differ by 25.1 TCF, slightly less than 10 percent. This is within the slated sampling error for the survey.

Critique

The purpose of this FPC study was to develop an independent estimate of the total proven gas reserves in the U.S. as of December 31, 1970. The only comprehensive estimates of U.S. natural gas reserves then available were those compiled by the AGA.

The results of both AGA and FPC studies can be used to complement each other, especially in evaluating procedures and the final estimates.

The FPC study was designed, controlled, and executed in a highly-acceptable manner. The sample design is statistically sound. The steps taken to maintain the confidentiality of the basic data were acceptable to industry. The use of independent FPC estimating teams to develop estimates of reserves from company-confidential raw data (electric logs, core sample analyses, pressure readings) avoided conditioning the estimates by the previous API (or company) estimates. The use of an independent Accounting Agent to do the tabulation and summarization led to written procedures for the treatment of the data and recognition of unforeseen problems. Because of the many units involved, a comprehensive set of published instructions are available. The FPC study should be considered of very high quality and its results (with qualifications as described later) may be used as a benchmark of gas reserves as of December, 1970. In addition, its sampling approach and operating procedures (use of an independent team and company records) have been proved operational.

The FPC gas reserve estimate, as published, is lower than the AGA estimate by slightly under 10%. This is not too alarming since it is within the usual acceptable sampling variability and: The FPC is a single time sample survey, and all sample surveys can be expected to vary about the "true" figure being measured; the characteristics of the basic units being measured—reservoirs, fields—are not always clearly defined and their measurement is accompanied by considerable latitude of personal judgment and recoverable reserves from a given field or reservoir also involves personal judgment and contributes to the variability expected.

The FPC report presents a comparison of its results with those of the AGA (Table 1 of the report). This implies that the AGA and FPC estimates are strictly comparable.

Three factors, of indeterminate magnitude, may have affected the FPC estimate and tended to make them closer to the AGA estimate. The first results from the use of a different definition; the other two from the method of operation.

A. The FPC Reserve Estimates Manual states "the estimator will not limit his consideration to the 'prevailing practice' in the field, but rather should consider the possibility of adding compressors or other equipment and base his estimate on the recovery efficiency which would result from installation of such equipment, if he felt it appropriate to install the equipment." [14] The installation of new equipment or the introduction of new producing techniques would result in a higher reserve estimate since it is not logical to add equipment or change production procedures to become less productive. As a result of this difference from the AGA definition, the FPC field estimates would be higher than corresponding AGA estimates whenever additional equipment or new techniques were assumed for a field. The FPC overall estimate would be affected and be too high. Its difference from the AGA reserves estimate would have been greater had such modifications in practice not been permitted. The effect of this definition change on the total U.S. reserve estimate depends on the number of instances in which improved equipment or techniques were introduced, and the average amount of increase in the reserve; the larger either of these two factors, the greater the increase in the total reserve. Unfortunately, an attempt to develop an estimate of the impact was unsuccessful, since contacting the FPC revealed that records of such variations were not available.

B. The FPC study was made in 1972, more than a year after the preparation of the AGA estimates. During this time period new equipment or technology may have been introduced at some recovery operations (apart from the assumed introduction mentioned above). This, too, would tend to increase the FPC reserve estimate wherever additional or new equipment was added or a different technology introduced. No information is available on the resulting effect on the total reserve estimate. However, any adjustment would tend to lower the FPC estimate as compared with the AGA estimate, thus increasing the difference between the two estimates.

Footnotes on page 169.

C. The FPC reserve team developed reserve estimates on a field-by-field basis using basic company-confidential records. The estimates were forwarded to a supervisor who compared each estimate with its corresponding AGA prepared estimate. The supervisor could return the FPC reserve team estimate for recheck by the originating team, or obtain re-examination by a senior reserve team.[15] The procedure of checking two independently-prepared estimates tends to bring them closer. Should a pair of estimates be close, they are accepted; should they differ (more than the criterion used), they are subjected to additional examination.

As a result, errors or other differences have little chance of being identified when they are incorporated in similar size estimates. If, however, an error occurs which results in a significant difference, the estimate would be re-examined and the error (or poor estimate) identified and corrected. Concentrating on differing estimates while tending to accept similar-size estimates is biased in favor of developing estimates of about the same size. The incidence of such checks, and their effect on the overall FPC estimate could not be readily secured from FPC. It should be noted that this bias is in favor of pulling the overall estimates closer, not making one consistently higher or lower than the other.

Adjusting for the effects of definition modification and the timing change (tendency to raise the FPC estimate) and the operating procedure which tends to equalize the size of the estimates, the difference between the FPC and the AGA estimates would become larger. Unfortunately, no data are available to quantify this effect. The AGA estimate is almost at the lower boundary of statistical reliability (sampling only) with 95% confidence. The difference after adjustments would, most likely, be greater. However, as stated by the study's validation team, the real yardstick for measuring significant differences in the estimates is a mixture of statistical findings and operation factors (inaccuracies of measurement). Thus the resulting difference, larger though it may be, cannot be used as concrete evidence that both estimates are significantly different. In future surveys, however, records may be kept which would tend to help quantify the effect of these factors. And these future surveys may be geared to test the Statistical Validation Team's statement that "both the possibilities of inaccuracy due to measurement and the statistically calculated reliability are of the same order of magnitude . . ."[16] A more accurate measure is needed for testing the significance of the difference between the two estimates. From a purely statistical approach (no operational differences), the AGA reserve estimate would be expected to be at least 10% higher than the FPC estimate once in about 40 readings. If the adjustments to the FPC estimates could be made, the difference would be greater and would reduce the expected incidence. The uncertainty of the variation contributed by operation differences, however, makes impossible a purely statistical approach and leads to the statement of "statistical insignificance".

2. National Petroleum Council Study—U.S. Energy Outlook

On January 20, 1970, the National Petroleum Council, an industry advisory board to the Secretary of the Interior, was asked by the Department of Interior to undertake a comprehensive study of the U.S. energy outlook. This marked the first time the NPC had been assigned a study which encompassed all energy forms.

The NPC established a Committee on U.S. Energy Outlook, which included over 200 representatives of the oil, gas, coal, nuclear, and other energy related industries. The organization chart for the NPC appears as Appendix C.

The 381-page study published in December, 1972 included chapters on both foreign and domestic oil and gas availability (1971–1985). The objective of the oil and gas portion of the study was to examine the factors which affect future supplies with a view toward increasing domestic supplies.

Ranges were assumed for drilling levels, finding rates and additional recovery efforts to develop new oil and gas supplies. Two finding rates (the volume of oil and gas found per unit of exploratory effort) were used to project oil and gas supplies. A low finding rate which represented an extrapolation of past trends and a high rate approximately 50% higher were assumed.

Three drilling rates were used ranging from a continuation of the current 4–5% per year decline to a rate which represented an approximate 6% increase per year. The three drilling rates and the two finding rates were then combined in a set of four principal cases for analysis.

Footnotes on page 169.

Oil reserve additions for the lowest case investigated (Case IV) are projected at about 2.8 billion barrels per year for the next 15 years. The highest case investigated (Case I) adds reserves at an average annual rate of 4.4 billion barrels.

In Case IV total annual gas reserve additions are projected to decline from 11 trillion cubic feet (TCF) in 1970 to an average of about nine TCF in the next 15 years. In Case I, total annual gas reserve additions are estimated to average 27 TCF.

The NPC report stated:

"The NPC's Future Petroleum Provinces Report (Ed. Note July, 1970) was used to define the discoverable oil-in-place of the U.S. In that report, estimated future discoverable oil was separated into 'probable and possible' and speculative categories. Only half of the speculative oil was included along with all of the probable and possible for purposes of this study. This represents the median (expectable estimate) presented in the Petroleum Provinces Study" [17]

Ultimate discoverable oil-in-place is estimated at 810.4 billion barrels, some 90.6 billion more than estimated in the Petroleum Provinces Report. In the case of ultimately discoverable gas, "the definition of ultimate gas discoverable was derived by combining the volumes of past production and current proved reserves with the Potential Gas Committee (PGC) estimate of the remaining potential supply of natural gas".[18] The study estimated ultimate discoverable gas at 1857.3 TCF.

The study concluded that U.S. oil and gas supply is not expected to be limited by the potentially discoverable resources during the period from 1971–1985 and that "an estimated 385 billion barrels of oil (48 percent of the estimated ultimate discoverable oil-in-place) and 1,178 TCF of gas (63 percent of the ultimate discoverable gas reserves) remained to be found at the end of 1970." [19]

Critique

Since the NPC study was prepared by industry representatives it is subject to the same criticism leveled at the API/AGA proved reserve statistics. The NPC estimates should be compared with the following tables contained in the study which demonstrates the wide disparity of estimates of ultimately discoverable oil and gas originally in place.

TABLE 2.—ESTIMATES OF ULTIMATELY DISCOVERABLE PETROLEUM LIQUIDS ORIGINALLY IN-PLACE

[In billions of barrels]

	1972 USGS	1969 Hubbert	1959 Weeks	1970 Moore	1968 Elliott and Linden
Lower 48 States	1,519	516	(1)	(1)	(1)
Alaska	376	78	(1)	(1)	(1)
Total United States	1,895	594	1,315	670	1,286

[1] Not estimated.

TABLE 3.—ESTIMATES OF NONASSOCIATED AND ASSOCIATED-DISSOLVED GAS

[In trillion cubic feet]

	1970 PGC	1972 USGS	1969 Hubbert	1959 Weeks	1970 Moore	1968 Elliott and Linden
Lower 48 States	1,877	3,556	11,312	(1)	(1)	(1)
Alaska	447	862	188	(1)	(1)	(1)
Total United States	2,324	4,418	1,500	11,250	1,934	2,175

[1] Not estimated.

Footnotes on page 169.

While the accuracy of the NPC estimates may be debated, it should be noted that studies of this type provide a more rational basis for national energy policy than the reliance on "proved" oil and gas reserve estimates alone.

A recent staff analysis of the Senate Committee on Interior and Insular Affairs entitled "Federal Energy Organization" criticized the over reliance on Industry data and mentioned the U.S. Energy Outlook Study in particular:

The Federal government also presently obtains data from industry which is not peculiarly industrial data. For example, the Department of Interior relies heavily upon industry for information concerning the potential value of fuel resources on the public lands. Greater disclosure of raw exploration data or exploration directly by the Federal agencies could be substituted for such information.

There are indications that the present Federal reliance upon energy information from industry is excessive. Federal decisionmaking is influenced not only by the facts, but the assumptions used in analysis. Furthermore, the Federal government is unable to recognize defiiciencies or errors in industry decisions.

The recently released U.S. Energy Outlook report of the National Petroleum Council is an example of predigested, policy advice which often is offered to Federal decisionmakers in the guide of industry data. An analysis of similar major energy studies which were available at the initiation of the Senate energy study showed that the underlying assumptions were so thoroughly concealed that the projections of supply and demand could not be reliably normalized among the reports considered.

The staff study further indicated that:

Greater Federal "in-house" data collection and analysis is needed. Technical field work (such as geologic exploration) should be assigned to technical agencies (such as G.S.). More authority to require "proprietary" data from industry and to verify it is probably needed. The analysis should be done by Federal agencies to insure validity from the Federal viewpoint.[20]

The U.S. Geological Survey Circular No. 650 also provides a discussion of the 1970 NPC Petroleum Provinces Study which was used extensively in the preparation of the U.S. Energy Outlook Study.

The data used were taken from table 22, p. 104, and several paragraphs of the report by Miller and others (1970). Their table 22 was based on a recovery factor for crude oil of 30 percent.

The original oil-in-place was estimated by NPC for each of 11 regions, in the three categories of probable, possible, and speculative, but the estimates for the probable and possible categories were reported as one figure. Ultimate recovery estimates were also made by the NPC using recovery factors of 42 percent and 60 percent, but they have not been included in figures 13–18.

A flat estimate of 49 billion barrels of ultimately recoverable NGL was reported in table 25, p. 108, of the NPC report (Miller and others, 1970) without any details as to how this quantity should be assigned to the various regions. Therefore, it is reported as a single number in figure 13. The quantity of original NGL-inplace reported under the NPC at the bottom of figure 13 was calculated by the USGS on the basis of an 80 percent recovery factor.

Future potential gas reserves were also reported in the NPC publication, but as these had been received from the PGC, they are reported in figure 16 with PGC as the source.

A variety of geologic methods were used in preparing the NPC report. The methods include extrapolation and interpolation along trends, comparison of similar areas and strata, evaluation of structures determined by geophysical prospecting, evaluation of the undrilled parts of known fields and pools, and assignment of average oil incidence to rock volumes. The results, though conservative, are probably the most detailed estimate of potential crude-oil reserves that has been made for the United States to date.

Some oil in the probable-possible category can be considered to have been already discovered but not cited as proved reserves at the time the NPC report was prepared. This is oil in undeveloped parts of fields and pools that have been "discovered" but not drilled out. There is no way to tell, from the report,

Footnotes on page 169.

how much this might be, but roughly it might be assumed to be an amount nearly equal to the proved reserves reported by the API.

The NPC report does not cover all potentially favorable areas. Those left out are onshore and offshore areas of Washington and Oregon; parts of North Dakota, South Dakota, Michigan, Montana, and the Great Basin area; the offshore areas of Alaska, except for parts of Cook Inlet and Bristol Bay; and the offshore areas of California north of the Santa Barbara Channel.

VI. CREDIBILITY

One of the most important aspects of the entire reserve estimate problem is the issue of credibility. Included in a discussion of this area are the subjects of validity of proved reserve figures, measure of these figures, and criticisms leveled by public officials, including members of Congress.

The most important aspect of the problem is that the concept of "proved reserves" is developed by the petroleum industry through its principal industry representative, the American Petroleum Institute. The key issue becomes: is is "credible" for the general public, Congress, and the Administration to rely on industry data to determine a component of national energy policy? Based on interviews with industry officials, it is clear that large segments of the petroleum and gas industries are of the opinion that current procedures lack "credibility" and that the Federal government should play a greater role in validating "confidentiality" of company information should be an essential factor in API–AGA proved reserve figures. Industry spokesmen stress the fact that any government program if industry cooperation is to be meaningful. In general, the "credibility" issue is somewhat analogous to the problem of "conflict of interest". Federal regulations involving "conflict of interest" provide that the "appearance of a conflict" is also a violation of the regulations, regardless of whether an actual conflict exists. Assuming that "proved reserve" figures are completely accurate, a problem still exists because the figures are suspect, being derived and compiled by industry without Federal validation. What is needed at the minimum is a capability which would permit a responsible Federal official to testify before a Committee of the Congress that the figures have been reviewed and validated under his supervision and that they can be relied upon.

Bureau of Budget study

The lack of standardization of terms also affects the credibility issue. The Petroleum Study Committee, in its September, 1962 Report to the President, concluded that "satisfactory information concerning petroleum reserves . . . is seriously lacking." The Bureau of the Budget (now the Office of Management and Budget) issued a Petroleum Statistics Report in March 1965 which recommended more technical description of reliable petroleum statistics, state and Federal governments explore the possibilities of using petroleum related information under regulatory and tax programs to develop general statistical use data, explore the possibilities of establishing, on a continuing basis, formalized relationships between the federal government and a group of experts from outside the industry, and periodic progress reports from those designated to implement recommendations and the circulation of such reports.

In the section on reserves, the BOB Report recognizes that petroleum reserves are not precisely measurable and that judgments enter into the reserve estimation process. The report discussed the availability of historical data and presented a scheme for classifying resources of known fields into several recoverable and non-recoverable categories. Recommendations in the reserve section recognize the need for estimates compilation by field while still maintaining the confidentiality of proprietary information. It was suggested that the Department of Interior consult with Federal agencies, state governments and other organizations and petroleum associated individuals to design a system that will provide data following the classification outline recommended.

There has been some agreement since 1965 on petroleum statistics, stemming from industry and governmental efforts. However, the main sources for current

petroleum reserves estimates are still industry prepared. The recent roles of API, AGA, and FPC in the current petroleum reserve statistical picture follows.

In 1966, API assumed the responsibility for setting standards for statistical reporting of petroleum industry operations in the U.S. Since then it has: Increased the amount of detailed information (recommended to be compiled) published following its established definitions, has published technical reports on the Standard Definitions for Petroleum Statistics (oil and gas); Organization and Definitions for the Estimation of Reserves and Productive Capacity of Crude Oil; including more descriptive material in this annual statistical reports, and has provided for closer and more intensive governmental participation by having an "official observer" at main committee meetings and several at subcommittee meetings (two regularly and one on a rotating basis).

Since 1965, API has continued to develop reserve estimates following the established procedures. An independent check on the variability of the estimates (at the field level), and an independent survey similar to the FPC survey has not been made. As a result, little more is known today than in 1965 about the effective quality of their estimates, of the potential effort of non-integrated company fields (small). And yet the API estimates are the only current series available; they are used as the basis for nearly all studies. And no other approach has been found suitable for replacing an expert appraisal of company confidential field-by-field available geologic and production data when developing an estimate of reserves.

From one approach, more intelligence may be possible from the existing body of API data. The definition of proved reserves is based on a working inventory approach and is conservative. The resulting estimate defined a "most likely minimum", not a probable or possible future volume if improved technology and equipment (and perhaps price) were allowed to be introduced.

Estimates of crude oil reserves in the U.S. have been consistently under estimated by API, as indicated by the series of API annual revisions. According to the API definition of revision:

Development drilling and production history add to the basic geologic and engineering estimates of proved reserves in years following the discovery. Changes in the earlier estimates, whether upward or downward, resulting from new information (except for an increase in proved acreage) are classified as "revisions". Revisions for a given year also include (1) increases in proved reserves associated with the successful installation of improved recovery techniques; and (2) an amount which corrects the effect on proved reserves of the difference between estimated production for the previous year and the actual production for that year.

Revisions, as defined, can be classified into two general types—(1) those that may raise or lower the prior estimate, and (2) those that can only raise the original estimate.

Revisions of type (1) result when: Preliminary production estimates are replaced by final production data becoming available. They may be higher or lower; drilling of additional wells in a reservoir better defines the production area thus providing additional information about the reservoir. Additional drilling would tend to increase the reserve estimate of a field if the usual practice of initial discoveries is to estimate reserves conservatively. Additional drilling, however, would contribute progressively less information until a point is reached where the additional drilling confirms or modifies the prior estimate. At that point in time, downward revisions may result. Given a long period of time with fields in all stages of development, the net result of additional drillings should not be expected to keep on increasing reserves for the prior period consistently; and mechanical or procedural errors are made in the large number of estimates being made, transcribed, and forwarded to the central office. Such errors are expected to be few in number and small in size since large errors would tend to be reviewed at the subcommittee or committee meetings. At any rate, these mechanical-procedural errors are not expected to result in increasing the prior year reserve estimate consistently.

Revisions of type (2) result from the successful application of improved recovery techniques, such as fluid injection, or the introduction of better equipment. These are expected to result in increased production or reserves since the expenditure of funds would not occur otherwise. Type (2) result from the successful application of improved recovery techniques, such as fluid injection, or the introduction of better equipment. There are expected to result in increased production or reserves since the expenditure of funds would not occur otherwise. Type (2) revisions are associated with technological improvements and have a repetitive upward push on estimates of reserves.

Estimates may be revised upward or downward. This is clearly revealed in Table I of the 1972 API Reserves Report which shows the positive and negative revisions by state. Several states show a net downward revision, but the overall 1972 adjustment is an increase of 820 million barrels. Table II in the 1972 API Reserves Report presents data on revisions at the U.S. level from 1946 through 1972, a period of 27 years. (See Appendix B.) During the period, all net revisions were upward, ranging from slightly under half a billion to more than two billion barrels. Such revisions are not trivial. In some years they constituted more than reserve increase resulting from extensions (in old fields), new field discoveries, and new reservoir discoveries in oil fields. And these revisions are comulative in nature—a revision once made is incorporated in the new estimate which becomes the base for the following year estimates.

From a probability approach, the chances of getting 27 upward revisions and no downward revisions from an unbiased estimating procedure is exceedingly small (less than 1 in 100 million). The 27 consecutive yearly upward revisions point to a methodological downward initial estimating process which is repeatedly corrected. This information can be used as the basis for improving the accuracy of the reserve estimates—develop a bias correction based on historical data to be applied to the current estimate. It should be pointed out that this adjustment may start at the field of reservoir level (different and may imply a change in API definition) ; or may be introduced at the overall U.S. level without allocation to states (easier, but also implies a change in definition since the estimated effects of improving technology are being introduced). Whatever the implications, the estimates of proved reserves would have been closer to the following year estimate if an average rate of prior years' revisions were incorporated.

One minor point should, perhaps, be made relative to the application of reserves to productive capacity. Reserves implies future recovery at a changing recovery rate—a combination of increased flow because of improved technology, and a reduced flow when a reservoir is reaching the end of its recovery capacity. The terminal recovery rate cannot be speeded up appreciably because of the geological formation constraints on the flow of the remaining in-place oil. Therefore, developing a reserve/production ratio may be of limited meaning since the stated production in a given year may not be attainable from the terminal flow of a reservoir. The inappropriateness of such a ratio has been pointed out in the past; it should be emphasized.

Consistency and application of "proved reserves" definition

The definitions of "proved reserves" for gas and oil are similar. The key words in the definition are: Estimated quantities * * * which geological and engineering data demonstrate with reasonable certainty to be recoverable, known reservoirs, and under existing economic and operating conditions.

This definition has been used by API and AGA in compiling and presenting data on gas and oil reserves. The measurement of the degree of application of the definition to everyday occurrances has not been measured (a type of quality control on either a spot, sample, or universal basis).

The FPC in its study of natural gas states "the primary goal of the program was to establish, on a consistent basis, a conclusive estimate of the proven reserves of natural gas available under existing economic and technical conditions." This differs from the API–AGA definition that the word "operating" has been replaced by "technical". Following its definition, the FPC study has instructed its estimating team to ". . . not limit his consideration to the

'prevailing practice' in the field, but rather should consider the possibility of adding . . . equipment . . .". This change in definition points the way to a different type of estimate produced by FPC.

Although the degree to which the definition has been followed by API and AGA has not been measured, the data themselves appear to indicate a variation when the Alaska discoveries were made. The AGA and API historical records by year of discovery include the Alaska find in 1968 (some 10 billion barrels of oil ultimately recoverable, 31 trillion cubic feet of gas). These findings do not appear as "proved reserves" in the U.S. total until 1970 (9.8 billion barrels of new oil field discoveries; 27.8 trillion cubic feet of gas in new fields). The 1971 and 1972 data show no impact of these new discoveries in the production totals.

Questions may be raised as to the strict application of the definition. There is no doubt (or quarrel) with the geological and engineering data, nor with acceptance of the reservoirs (even though size may be indeterminate). There may be no doubt that the technology exists for recovery on an economic basis. No production has resulted in the three years since the "proved reserves" appeared in the total reserve. The only condition that appears to have prevented production is "existing operating conditions". And since these conditions are preventing production, one may question whether the find had been included in "proved reserves". The question to be asked is whether an extremely large discovery should be treated differently than any other discovery. It should be accepted that the information about the discovery is important; but perhaps it should be handled in a special manner until such time as it becomes recoverable under "existing conditions". This may be accomplished by carrying a footnote explaining the find, the reason for its not being included, and its approximate size.

The Alaska discovery may have been introduced for public relations considerations. This is of course understandable. However, if the discovery were smaller and it were introduced, the impact would not have been obvious and th definition would have been violated. Consistency in statistical procedures must be maintained if credibility is to be assured. The frequency of occurrence of such deviations from the present standard definition is not known.

The potential problem of differing estimates which may result from non-exact definitions is clearly brought to light by the FPC definition. The substitution of the word "technical" for "operating" conditions would result in the inclusion of the Alaska discovery in the FPC estimates. This difference points to the need for additional classifications which would categorize the item more definitely—perhaps future recoverable reserves (under certain conditions) or probable reserves or possible reserves.

Because of the importance of oil and gas to the United States economy, data on reserves are widely disseminated. The Federal government, the oil and gas industries, banks, financial and economic analysts, newspapers, and magazines are principal users of these findings. Reserve figures provide the basis or departure point for many analytical studies. Unfortunately many of those working with the data are unaware of the limitations imposed in the definition of "proved reserves" or the methodology used to estimate proved reserves.

As previously mentioned one of the common misunderstandings involves the belief that proved reserves of oil and gas represent the total known quantities of these resources.

Of all the calculations derived from API figures, the most widely known and commonly referred to is arrived at by dividing annual production into the aggregate proved reserves at the end of each year. To this ratio of proved reserves to production the names of "reserve life index" of "reserve ratio" are commonly assigned. The almost mysterious quality of this ratio is its remarkable stability over time. For fifteen years, 1946–1964, proved reserves at year end varied only 11.5 and 13.5 times the annual production. At the higher level of the scale of ignorance about reserve figures this ratio is often interpreted to mean that, at present rates of production, all the known oil will be exhausted in eleven to thirteen years, and any further domestic supplies will be dependent upon future discoveries. The name of "reserve life index" is well designed to foster this misapprehension.[21]

Footnotes on page 169.

Many equate proved reserves with the amount of oil and gas ultimately recoverable which will be produced from known fields. However, as has been described earlier, production has consistently been much greated than the initial estimates of proved reserves.

As a means of demonstrating the costs of exploration and development of new reserves, the reserve additions for a given year are divided into the exploration, development, and production expenditures on exploration, development, and production made in prior years as opposed to current expenditures.

It is also possible to find statements in studies which relate drilling activity to additions to reserves. This type of study divides the number of barrels of API reserves added by the number of total or exploratory wells or by the footage drilling in each category, to get the number of barrels found per well or per foot drilled. Such studies, if adequately explained and properly done with the necessary time adjustments in the data, can be informative. However, such data are almost invariably related in a superficial fashion to prove a point and rarely are the limitations of reserves data explained.[22]

The criticism of proved reserve figures has intensified in the last several years, primarily due to the controversy surrounding the shortage of domestic oil and gas to meet current energy requirements. However, many of the recent criticisms are surprisingly similar to those heard in the past. Critics of reserve figures charge that the accurancy and credibility of these figures is suspect since they are industry generated figures. It is argued that industry figures are subject to manipulation for selfish economic interests insce these statistics are used to demonstrate the need for government incentives to promote the exploration, development, and production of oil and gas or in the determination of the wellhead price of natural gas, for example, by the Federal Power Commission. It is argued that as a matter of public policy the government should make its own determination of proved reserves and make estimates of the future prospects for discovery, development, and production of oil and gas rather than relying on industry projections or those prepared principally by industry responsentatives.

Two examples of recent criticisms are cited below. First, the Subcommittee on Special Small Business Problems of the House Select Committee on Small Business, in its findings addressed itself to criticisms of gas reserve data.

Relying largely on industry-supplied gas reserve data, the FPC has granted gas producers sizeable wellhead rate increases in an effort to coax gas producers to explore, drill, and develop new gas supplies . . . . Those opposed to the use of the AGA reserve information assert that the industry-furnished gas reserve estimates have not been subjected to an independent in-depth analysis and evaluation. In addition, these critics state that the confidentiality restriction imposed on AGA gas estimates have resulted in a denial of the true facts about the Nation's gas supply situation to small business and consumers, who ultimately must bear the heaviest burden of the rate increases.

. . . the Federal Government should conduct an independent in-depth reservoir-by-reservoir evaluation of the Nation's gas reserves . . . free of the taint of industry understatement. Independent reserve estimates would also provide the Federal Power Commission with the opportunity to liberate itself . . . In addition, other Government decisionmakers could utilize this data in developing a realistic and viable natural resource policy . . . detached from industry domination.[23]

Secondly, in testimony before the Subcommittee on Antitrust and Monopoly of the Senate Committee on the Judiciary in June 1973, James T. Halverson, Director of the Bureau of Competition of the Federal Trade Commission, charged that "serious under-reporting by the natural gas producers to Federal Power Commission of natural gas reserves has existed and continues to exist; the procedure of reporting reserves through a subcommittee of the American Gas Association composed of employees of major producers could provide the vehicle for a conspiracy among the companies involved to under-report gas reserves, but more information is needed in this area."

Footnotes on page 169.

Halverson also pointed out that original estimates of natural gas reserves can only be obtained from company sources which are not subject to independent audit. In addition, company documents on reserves and AGA estimates from 1962 to 1970 when compared by FTC staff revealed discrepancies which increased significantly in 1968 and 1969. Halverson charged that in-house company estimates of proved reserves applicable to the South Louisiana area, which were used primarily for tax purposes, had been found to be lower than estimates or proved reserves that were used to justify decisions to build drilling platforms or to sell reserves to a pipeline company. According to Halverson, the differences in these proved reserve figures in some cases amounted to over 200%.

FOOTNOTES

[1] Bradner, Tim. *Oil and Gas Conservation Regulation in Alaska:* Review of Business and Economic Conditions, University of Alaska, Institute of Social, Economic and Government Research, Vol. X, No. 1, July, 1973, P. 7.

[2] Theobald, P. K., Schweinfurth, S. P., and Duncan, D. C., *Energy Resources of the United States,* U.S. Geological Survey, Circular 650, 1972, p. 19.

[3] Hendricks, T. A. *Resources of Oil, Gas and Natural-Gas Liquids in the United States and the World,* U.S. Geological Survey, Circular 522, 1965, p. 3.

[4] *Ibid.,* pp. 8–10.

[5] A somewhat more detailed discussion of some of these points may be found in Risser, H. E., *Energy Supply Problems for the 1970's and Beyond,* Environmental Geology Notes, Number 62, Illinois State Geological Survey, May, 1973.

[6] Winger, J. G., et. al., *Outlook for Energy in the United States to 1985,* Chase Manhattan Bank, Energy Economics Division, June, 1972, p. 5–55.

[7] In addition to consulting the published writings of Prof. Adelman, Energy Research Inc.'s economic consultant interviewed him by telephone. However, the views expressed in this report are not necessarily those of Prof. Adelman.

[8] BP *Statistical Review of the World Oil Industry—1972,* London, 1973, p. 5.

[9] Bradner, Tim, *op. cit.,* p. 12.

[10] Reed, J. C., *Oil and Gas Development in Arctic North America Through 2000,* The Arctic Institute of North American, September, 1973.

[11] *Organization and Definitions for the Estimation of Reserves and Productive Capacity of Crude Oil,* Technical Report No. 2, American Petroleum Institute, Washington, D.C., 1970.

[12] Federal Power Commission. *National Gas Reserves Study,* May 1973, Appendix IV, p. 7.

[13] National Petroleum Council, *U.S. Energy Outlook (A Summary Report),* Washington D.C., December 1972.

[14] *Reserves Estimation Manual,* Federal Power Commission, Washington, D.C. p. 13.

[15] *Ibid.,* p. 8.

[16] Federal Power Commission. *Op. Cit.,* Appendix VI, p. 26.

[17] National Petroleum Council Committee on U.S. Energy Outlook, *U.S. Energy Outlook,* Washington, D.C., December, 1972, p. 70.

[18] *Ibid.,* pp. 80–81.

[19] National Petrolem Council. *Op. Cit.,* p. 35.

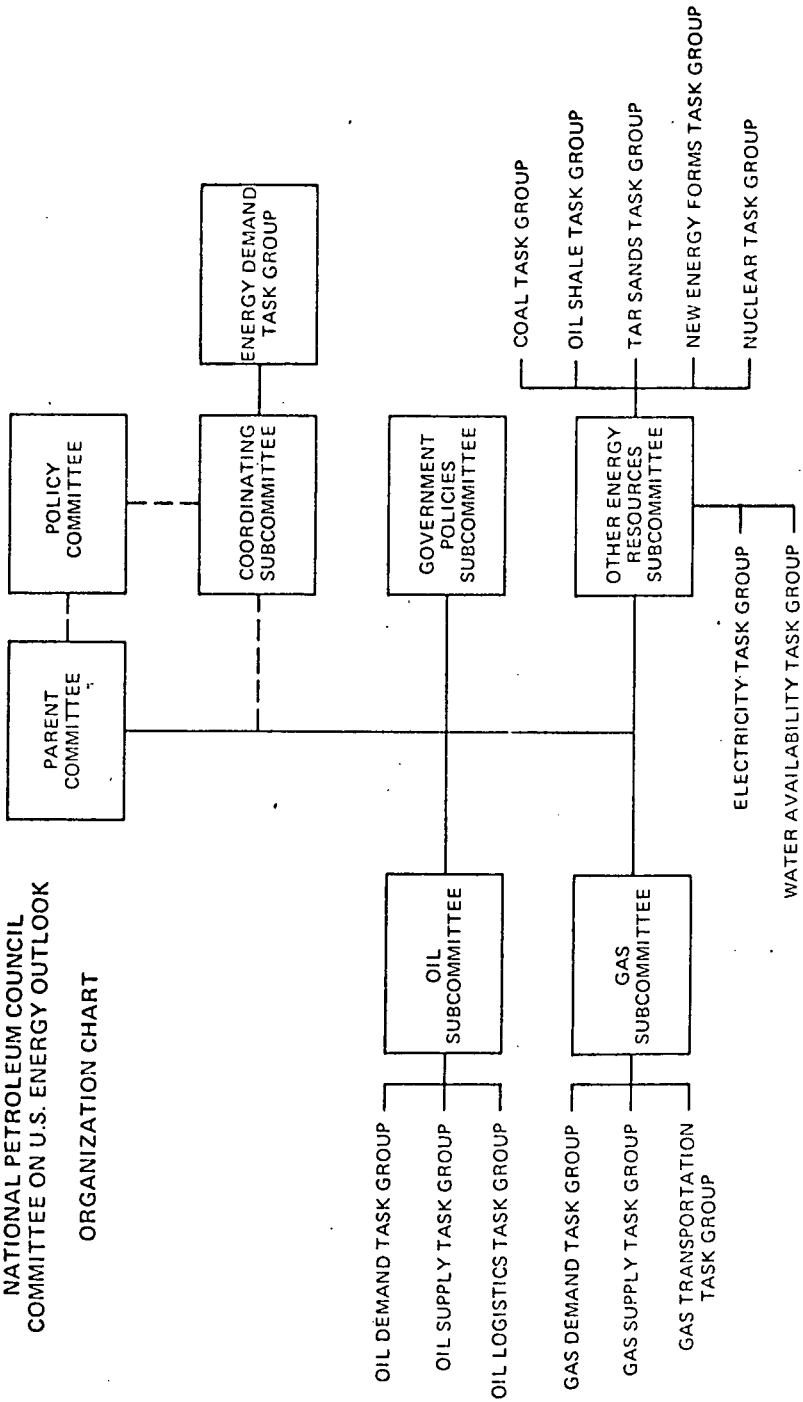
[20] *Federal Energy Organization,* a staff analysis, U.S. Senate Committee on Interior and Insular Affairs, 1973, pp. 22–23.

[21] Lovejoy, Wallace F. and Homan, Paul T. *Methods of Estimating Reserves of Crude Oil, Natural Gas, and Natural Gas Liquids,* Resources for the Future, Inc., Washington, D.C., 1965, p. 24.

[22] *Ibid.,* p. 27.

[23] *Concentration by Competing Raw Rual Industries in the Energy Market and its Impact on Small Business,* Vol. 3, A Report of the Subcommittee on Special Small Business Problems of Select Committees on Small Business of the House of Representatives. 92nd Congress, September, 1972.

APPENDIX C


NATIONAL PETROLEUM COUNCIL
COMMITTEE ON U.S. ENERGY OUTLOOK
ORGANIZATION CHART
PARENT COMMITTEE
POLICY COMMITTEE
COORDINATING SUBCOMMITTEE
ENERGY DEMAND TASK GROUP
GOVERNMENT POLICIES SUBCOMMITTEE
OTHER ENERGY RESOURCES SUBCOMMITTEE
COAL TASK GROUP
OIL SHALE TASK GROUP
TAR SANDS TASK GROUP
NEW ENERGY FORMS TASK GROUP
NUCLEAR TASK GROUP
ELECTRICITY TASK GROUP
WATER AVAILABILITY TASK GROUP
OIL SUBCOMMITTEE
OIL DEMAND TASK GROUP
OIL SUPPLY TASK GROUP
OIL LOGISTICS TASK GROUP
GAS SUBCOMMITTEE
GAS DEMAND TASK GROUP
GAS SUPPLY TASK GROUP
GAS TRANSPORTATION TASK GROUP

APPENDIX D

Bibliography

One of the purposes of this study is to identify the available source materials regarding the subject of oil and gas reserves. The following references were developed in the course of ERI's research effort.

Adequacy of Mineral Fuels, Robert E. Hardwicke, American Academy of Science, Washington, D.C.

America's Stake in World Petroleum, Roger, Sharp, Harvard Business Review, 1950, Cambridge, Massachusetts.

An Analysis of Natural Gas Supplies, Martin Elliott, Journal of Petroleum Technology, February 1968, 135–41.

Annal Statistical Review, United States Petroleum Industry Statistics, April, 1972, Washington, D.C.

Assessment of Available Information on Energy in the United States, U.S. Senate Interior and Insular Affairs Committee, 1962, Washington, D.C.

Basic Factors Affecting the Future Supply of Natural Gas for the Interstate Market, American Petroleum Institute, 1959, Washington, D.C.

British Petroleum Statistical Review of World Oil Industry 1972, British Petroleum Company, Ltd., London, 1973.

Capability of the Naval Petroleum and Oil Shale Reserve to Meet Emergency Needs, General Accounting Office, U.S. Government, 1972, Washington, D.C.

Charts on New Reserves of Natural Gas Found Annually, Gas Wells Completed Annually in the United States, Northern Natural Gas Company, 1969.

Charts for 1969–1990—Statistical Depletion of Proved Reserves and Potential Supply of Natural Gas in the United States as of December 31, 1968, John M. Hanley, Northern Natural Gas Company, 1969.

Common Fallacies in Oil and Gas Reserve Estimates 1967, William Huckaba, Willis Meyer Society of Independent Professionals and Earth Scientists.

Concentration by Competing Industries in the Energy Market and Its Impact on Small Business, House Select Committee on Small Business, 92nd Congress, September 1972.

Concerning Estimates of Potential Oil Reserves, Lewis Weeks, American Association of Petroleum Geologist Bulletin, Vol. 34:1, page 947.

Crude Reserves, J. R. Arrington, Oil and Gas Journal, 1960, No. 9, 130–135.

Definition of Petroleum Resources, Martinez, Annibal 1962, Organization of Petroleum Exporting Countries.

Domestic Oil Reserves As Affected By Wellhead Prices, Kenneth Price, 1965 (Speech), Washington, D.C.

Economic Aspects of National Gas Supply, Bruce Netschert, 1962, Johns Hopkins Press, Baltimore, Maryland.

Economic Potential of the Mineral and Botanical Resources of the Continental Shelf and Slope, Economic Association, 1968.

Energy Model for the United States 1947–65, Warren Morrison, Charles Reading Bureau of Mines, Department of Interior, Washington, D.C.

Energy Resources, M. King Hubbert, National Academy of Science, San Francisco, California, W. H. Freeman and Company, 1969.

Energy Resources of the United States, United States Geological Survey, Circular 650, 1972, Washington, D.C.

Energy Supply Problem of 1970 and Beyond, H. E. Risser, Illinois State Geological Survey, May 1973, Chicago, Illinois.

Energy Under the Oceans, Don Kash, Irvin White, University of Oklahoma, 1973, Norman, Oklahoma.

Estimates of Additional Recoverable Reserves of Oil and Gas for the United States and Canada, Degolyer and MacNaughton, 1969, Dallas, Texas.

Estimation Manual, Federal Power Commission, 1972, Washington, D.C.

Estimation of Future Reserves, J. R. Arrington, W. Texas Geological Society, 1966.

Estimation of Natural Gas Reserve, Ralph Davis, April 1964, Gulf Publishing Co., Houston, Texas.

Factors Affecting United States Exploration Development and Production, 1964–65, National Petroleum Council, 1967.

Gas Supply: A Panel Presentation, American Gas Association, Boston, Mass. 1971.

Gas Supply and the National Energy Situation, American Gas Association. April 1972, Washington, D.C.

Graphic Review of United States Oil Reserves, 1952, Petroleum Administration for Defense, Washington, D.C.

Method for Evaluating U.S. Crude Oil Reserves and Projecting Domestic Crude Oil Availability, C. L. Moore, U.S. Department of Interior Office of Oil & Gas, 1962.

Methods of Estimating Reserves of Crude Oil, Natural Gas and Natural Gas Liquids, Wallace Lovejoy, Paul Homan, Resources for the Future, Inc., Johns Hopkins Press, Baltimore, Maryland, 1965.

National Fuel Reserves and Fuel Policy, Senate Interior and Insular Affairs, 1951, Washington, D.C.

National Gas Reserves Study, A Staff Report, Federal Power Commission, May 1973, Washington, D.C.

National Petroleum Council Studies:
Committee on Oil and Gas Availability, 1964–73.
Petroleum Productive Capacity, 1952.
Committee Proven Petroleum and Natural Gas Reserves and Availability, 1961.

Natural Gas Supply and Demand 1970–1990 Staff Report #2, Bureau of Natural Gas, Federal Power Commission, 1972, Washington, D.C.

Oil and Gas Conservation Regulation in Alaska, Tim Bradner, Review of Business and Economic Condition, University of Alaska, July 1973.

Oil and Gas Development in Arctic North America Through 2000, J. C. Reed, The Arctic Institute of North America, September 1973, Washington, D.C.

Oil and Gas Property Appraisal Reports, Willis Meyer, Society of Independent Professionas & Earth Sclientists, 1967.

Organization and Definitions for Estimation of Reserves and Productive Capacity of Crude Oil, Technical Report #2, American Petroleum Institute, June 1970, Washington, D.C.

Outlook for Energy in the United States to 1985, J. G. Winger, Chase Manhattan Bank, June 1972, New York City, New York.

Petroleum Productive Capacity, National Petroleum Council and Office of Oil and Gas, Department of Interior, 1952, Washington. D.C.

Petroleum Reservoir Engineering, James Amyx, Gulf Publishing Company, 1960. Houston, Texas.

Potential Gas Committee Study on Supply of Natural Gas in the United States, Golden, Colorado, Colorado School of Mines, December 1968.

Projections of Petroleum Supply to 1980, C. L. Moore, U.S. Department of Interior, Office of Oil and Gas, 1966.

Proved Reserves of Crude Oil and Natural Gas Liquide and Natural Gas, April 1972, American Petroleum Institute, Washington, D.C.

Quantitative Evaluation of Predicted Reserved of Oil and Gas, N. J. Buylov, N. S. Erofeev, 1964, Russian Consultants Bureau, New York, New York.

Resources of Oil and Gas and Natural Liquids in the United States and World, T. A. Hendricks, Geological Survey Circular 522, 1965, Washington, D.C.

Standard Definitions for Petroleum Statistics, Technical Report No. 1, American Petroleum Institute, July, 1969, Washington, D.C.

Supply and Price of Natural Gas, M. A. Adelman, 1962, Basic Blackwell, & London.

Survey of Action by State and Federal Regulatory Agency, Statement by Staff Experts to Gas Committee, 1972, National Association of Regulatory Utility Commissioners.

Symposium of Fuel Reserves in United States, George Armistead, The Journal, 1967, Washington, D.C.

Systems Study of Data Availability on Natural Gas, Bureau of Mines, United States Department of Interior, 1971, Washington, D.C.

Ultimate Domestic Petroleum Discoveries and Discovery Rates, C. L. Moore, Trans. of the West Texas Geological Society, Publ. 66–53, 1966.

United States Energy Outlook, National Petroleum Council, December 1972, Wash., D.C.

United States Petroleum through Year 1980, National Petroleum Council, Wash., D.C. 1968.

World Offshore Petroleum Resources, Lewis Weeks, American Association Petroleum Geologists Bulletin, 49 1680–93.

Chairman PROXMIRE. Mr. Nader, you reflect a very widespread public skepticism and you articulate it more emphatically and clearly than I have heard it. You say as I understand it, that you think the energy crisis is a fake. It is a phoney. You do not believe it. At the same time there do seem to be facts and figures which show that the availablity of imported oil from the Arab countries which is around 10 or 12 percent of our total consumption in the past has been at least partially interrupted. Leakage permits us to get 600,000, perhaps 1 million barrels a day but that is far less than the 2½ to 3 million barrels that we got.

Now, given our wasteful practices, given all these other defects which you properly point to, would you agree that we do have a shortage in the sense that we do not have as much oil available as there is clearly a demand for at the present time?

Mr. NADER. Well, given the waste, as you say, I would not. There already is a reduction of demand due to conservation effects.

Chairman PROXMIRE. But it is a fact of life that a lot of the consumption is wasteful, I would agree.

Mr. NADER. That is right. As you pointed out, to analyze whether there is an energy shortage now, you have to ask how much is demand decreasing which, of course, relatively increases the supply that is available, and how much is available. I think the demand is decreasing. The figures show that whether they are Consolidated Edison figures for reduction in electricity demand to other figures that have been displayed in newspapers around the country recently. But I also maintain that the Government has not proven its case that there even is an energy shortage of available supply, that they may be able to get information later on but they have not proven their case. In fact, in the last few weeks it has been just the opposite. They suddenly discovered a 70,000-barrel-a-day increase in imported oil that they did not allow for in their leakages in other areas as well.

For instance, let me give the most recent——

Chairman PROXMIRE. Let me say what we have gotten, you see, is a public report from the oil companies, as I understand, which they are making regularly now which has indicated that they have a greater supply in many categories than they had last year at the same time. However, I think that while they specify that, they indicate that the availability of crude coming now into the pipeline is substantially less than it was last year and, therefore, if we maintain something close to the same consumption as we did last year, there is going to be a shortage this spring. That is what they are concerned for and prepared for.

Mr. NADER. That is exactly what they said in October would be the case for November and December.

Second of all, never underestimate their ability to store or withhold supplies or reallocate supplies in order to postpone their bringing these supplies to market. For instance, on January 1, I believe, or thereabouts, a massive tanker owned by Texaco took on refined gasoline from a refinery in the east, around the New Jersey area, and set sail through the Panama Canal to California with millions of

gallons refined gasoline. Here was the east coast supposedly thirsty for refined gasoline and they were taking this slow boat to California so that by the time this tanker reaches California, perhaps the prices will be higher and they can make more profit.

Secondly, the magazine Petroleum Economist which comes out of London, said that world crude oil output rose 8 percent or 1.6 billion barrels to nearly 20 billion barrels in 1973 despite the Arab production restrictions started in October. Here is the critical statement. It said, "The increase would have been closer to 10 percent without the restriction." That is, it was an 8–percent increase instead of a 10–percent increase. As you know, other countries have increased there output.

Chairman PROXMIRE. Increase in 1973 compared to 1972?

Mr. NADER. That is right.

Chairman PROXMIRE. Of course, world consumption has increased very rapidly, too. In this country it goes up, what, 7 or 8 percent a year and abroad it goes up even more rapidly.

Mr. NADER. Yes. You see, that is another point. The point I am making is that they have attributed a 2–percent decline in the increase. In other words, instead of a 10–percent increase if there was no embargo, there is now an 8–percent increase because other countreis such as Iran and Nigeria have been increasing their output.

Chairman PROXMIRE. Let me get to what you think you see as our policy responsibilities here. Should Congress try to force the administration to control prices by spelling out in law a specific price control program?

Mr. NADER. Yes. I think for the short term there needs to be not only a price control, but there needs to be a price rollback.

Chairman PROXMIRE. Can you tell us what kind of data disclosure legislation should be required?

Mr. NADER. Yes. I think—I do not want to repeat what you have said this morning in terms of what is needed.

Chairman PROXMIRE. Do you favor the——

Mr. NADER. Storage, for example.

Chairman PROXMIRE [continuing]. Nelson bill?

Mr. NADER. Reserves, oil and gas reserves. The levels at which these reserves prevail underground, cost figures, refinery capacity, refinery output, storage tank levels, et cetera.

But I would have some more structural recommendations, Mr. Chairman. For example, are you aware that the Freedom of Information Act when it was passed a few years ago, had a specific exemption for data from the U.S. Geological Survey? Now, I would eliminate that exemption. That specific exemption came from the oil industry.

For instance, does it not outrage you that the information which the oil companies obtained on the leases that the Federal Government gives them is considered confidential? That is, the people cannot have this information and it is information on extent of reserves on Federal land, presumably owned by the people.

Secondly, I would require consumer and business user groups as well as independent representation on all advisory groups associated with the energy issue. That is an information issue. You

see, right now Mr. Simon has segregated advisory committees. He has one for the oil producers, the big ones, then one for the independents, and one for the consumers. I asked him, "Do you not think there would be a better exchange if they were all mixed so you could have consumers across the table from the majors and independents?" He said, "I will take that under consideration." But, you see, unless that occurs, we are going to have the typical symbiotic relationship between the Federal agency and these industry advisory committees and there is going to be a flow of secrecy both ways that is not helpful.

Chairman PROXMIRE. Let me ask you this. You have been very, very critical of Mr. Simon and the people he has advising him and the people carrying out policy in the Energy Office. Do you think Congress is in the process of turning over too much authority to the proposed Federal Energy Administration and how would you like to see the bill altered before it is enacted? I am talking about the energy bill that is still pending because we did not act on it at the end of the Congress.

Mr. NADER. Well, I think in a number of ways there is too much of a discretionary grant of authority to the Federal Energy Office. For example, I disagree strongly with the information disclosure requirement which I noted in my prior remarks. I do not think the public is given legal standing of sufficient clarity to challenge the agency's rulings in court. You will notice that we have that same problem with the Price Commission and unless people can challenge the Federal Energy Office's determinations in court, there is going to be government by fiat.

I think thirdly, there needs to be, and this is quite important, a consumer advocate's office right in the agency to represent the interests of the consumer and to represent the interests of Congress in finding out really what is going on inside that agency.

I think fourthly, there need to be tougher penalties for violations. In these acts, for example, they have one bite of the apple where they have a modest fine of a few thousand dollars before any criminal penalties apply for willful and knowing violation.

I think finally, and this is something that Congress cannot do very much about unless it really exerts its prerogatives, that is to make sure that the people who run this agency feel for the people in this country, feel for their interests in health and safety as well as in the economy of their purchasing power and that is what I do not see occurring in terms of appointments that are being made in that office.

Chairman PROXMIRE. You called for a price rollback, actually reduce the present prices of gasoline and oil. That, I am sure, consumers would welcome but do you really think that is practicable? Would that not have an immediate adverse effect on production if we actually reduce prices and how much of a rollback would you think is practical or possible?

Mr. NADER. Well, I think we need, first of all, a selective rollback to make sure that the foreign oil does not distort—the foreign price of oil does not distort domestic price. By selective, I mean if we are going to have a rollback we had better have an export tax or a

control on exports of oil. Otherwise we are going to see the traditional pressure to get it sold overseas or to cycle it back by getting it overseas and bringing it back as imports which are not subjected to price controls. There needs to be a study made as to the precise amount of rollback that is necessary. But I think the answer is in the profit figures, Senator Proxmire. If they are receiving higher and higher profits and if Mr. Heller's predictions are right, then you need a rollback which is equivalent to to a kind of generic excess profits tax.

Chairman PROXMIRE. That prediction by Mr. Heller assumes there will be a very further sharp increase which Mr. Simon indicates he expects, too, this coming year, going from $5.25 to $7 a barrel, that the gas pump price will go up to at least 55 cents. Testimony this morning suggests to me it is likely to go substantially higher than that. So it seems to me the practical thing we ought to do is try hard to hold the line or at least not permit it to go up as high as it would go if they simply let their own preference take its course.

Mr. NADER. You see, that is the position that the Federal Energy Office and the Cost of Living Council is putting you in.

Chairman PROXMIRE. That is right.

Mr. NADER. They are putting us all in the position of saying let us first make sure it does not go higher rather than say, look, there have been fantastic windfall profits and consumer gouging here. I think Mr. Freeman and Mr. Allvine who will come this afternoon, will detail the extent of this.

Chairman PROXMIRE. Before I yield to Congressman Conable, let me just ask you this. There has been a lot of discussion and a lot of people around the country, a lot of people in my State, for example, have brought up the possibility of nationalizing the oil industry. A very powerful Senator has suggested we make it subject to public utility regulation. My own preference is for vigorous antitrust action to require competition. How do you come down in that area?

Mr. NADER. I come down in three ways. One, vigorous antitrust action to break the oil major up and to make a more competitive industry to the point, for example, of severing a pipeline's activities from the producing and refining activities and eliminating the vertical integration that has stifled the independents on both ends of the producer and retail area.

Second, I would advocate a Federal oil and gas energy corporation on the model of the TVA to be a yardstick, to make sure supplies will always be available for national contingencies and emergencies and for small refineries, distributors and retailers whose being driven out of business by monopolistic practices and to explore for and produce oil and gas on Federal lands where so much of the new oil and gas remains to be found.

And third, I would give the potential victims of oil industry policies and Government policies their full right to sue individually and under class actions. That means to sue not only for price rollbacks, not only for private damages, but also to sue for information. It is not enough simply to say you, Mr. Simon, should give this information. What if he does not? There has to be not only a con-

gressional review function here but also the exposure to expeditious litigation.

I think with that combination of policies we will see the onset of what the Economist has called the coming energy glut, and I would like to submit for the record an article which has appeared in the Economist of London entitled "Too Much Energy." It is their case for predicting that there is going to be an energy glut over the next few years and the rest of the century.

Chairman PROXMIRE. We will accept that for that record.

[The article referred to follows:]

[Reprinted in the Washington Star-News, Jan. 13, 1974]

TOO MUCH ENERGY

(From the Economist)

There is a case for arguing that the world is likely to be glutted with energy before the end of this decade. The present energy "crisis" is about the 15th time since the war when the great majority of decision-influencing people have united to say that some particular product is going to be in the most desperately short supply for the rest of this century. On each of the previous occasions the world has then sent that product into large surplus within 5–10 years.

The reasons for this are now quite logical and rather technical. In modern conditions of high elasticity of both production and substitution, plus surprisingly equal lead times for many investment projects, we now generally do create overproduction of whatever politicians and pundits 5–10 years earlier thought would be most urgently needed, because both consensus-seeking governments and profit-seeking private producers are triggered by that commentary into starting the overproduction cycle at precisely the same time.

In 1946–49, a agricutural experts forecast a permanent postwar shortage of dairy produce; this led to butter mountains within a decade.

In 1950–51, the Korean war boom was said to show that raw material prices would keep rising forever; instead, some took until 1970 to regain their 1950 peak. In particular, an international action group was set up in 1951 to deal with the world's "worst permanent bottleneck" of sulphur, shortly before the stuff became practically unsaleable.

The future chief economic adviser to the British Treasury published his book on the world's lasting dollar shortage in 1953–54, which was the first of the world's 20 consecutive years of dollar surplus.

Russia's first sputnik in 1957 was said to be so far ahead of the West's conceivable technology that it would leave America for the rest of our lives at the back end of a "missile gap"; within six years the Americans were preparing to fire surplus rockets at the moon.

Then there was going to be a worldwide shortage of university graduates especially from the science departments; within a decade they were one of the bigger groups of the unemployed.

As the 1960s started, there were said to be limitless prospects for offshore funds and other equity investment media for the small man, for go-go business conglomerates, for high technology companies like Rolls-Royce; these were therefore the ventures that went bust (as property developers and then North Sea oil may in the 1970s).

In the mid–1960s we were told it was impossible to bridge the lasting technological gap between America and the rest of the world; this meant that the dollar would soon be devalued.

As a result of yesterday's trendinesses, we now have created in the developed world an unfortunate excess of both birth control devices and anti-pollution controls, although the rearguard of yesterday's preachers about ever-rising birth rates and ever-increasing pollution is still infuriated when the figures are pointed out.

Energy has played its part in the game of cheat-the-prophet, too.

During the coal crisis of 1947, it was said that no coal miner in Europe or Japan need fear for his job during the rest of this century; within a decade a majority of European and Japanese coal mines had closed down.

In 1956, France and Britain went briefly to war because the closing of the Suez Canal for a week would starve Europe of oil and cause an insurmountable world shipping shortage. The two nations went to war even though it was agreed that this invasion would put France and Britain into the Arabs' bad books for a millennium.

Instead, Europe continued its quick switch to cheaper oil even when the canal closed again; the rear-admiral whom Mr. Macmillan appointed to ration Britain's share of world shipping was still recruiting staff when the biggest-ever laying-up of the world's surplus shipping began; within rather less than a millennium France and Britain are the Arabs' European friends.

For the last 200 years, energy seems to have had a higher elasticity of supply than anything else except transport. Indeed, the accelerating elasticity of supply of these two things is what the industrial revolution since Watt's steam engine has been largely about.

A product generally has a high elasticity of supply (a) if it can be produced in many different ways; (b) if technology seems on the brink of bringing in more powerful new ways; (c) if the distribution system for it can be greatly improved. Gluts will also occur if (d) economies of the product's use seem fairly easy Energy fulfils each of these conditions in profusion.

There are many thousand possible ways of releasing energy from storage in matter. They range from petty ways like 25 BTU per pound of matter by letting a pound of elastic bands untwist; through fairly petty ways, like 20,000 BTUs by burning a pound of petrol; through more sophisticated ways like 250 million BTUs from the fission of the U–235 isotope in one pound of natural uranium; up to 260 thousand billion BTUs frm the fusion to helium of a pound of hydrogen. Note that this last system, in which the waters of the oceans could serve as a limitless reservoir of fuel, would therefore be more than 10,000,000,000 times more effective per pound of matter than burning a pound of the Arabs' oil. Of course, new technology will drive on towards the cleaner power sources nearer the top of the range.

The distribution of electricity—and, indeed, of all energy—is grossly inefficient. Look at the towering chimneys of your local power station to see how many of them throw up into the wasting air two-thirds of the heat and energy they could produce. Remember that those in control of most devices for bringing you the energy released from storage in matter have not been concerned with economising on the use of that energy, because far too many distribution systems, from garages to antediluvian electricity transmission lines, are in the hands of monopolies (especially the worst sorts of monopoly, called public utilities) which do not have a competitive incentive to attract your custom by improving their technology.

Among possible economies in energy use, the Americans would save the equivalent of three-quarters of Britain's annual imports of oil if they used cars with the same economy of fuel consumption as Europe's. The whole advancing revolution of microm-iniaturisation with integrated circuits will be enormously energy-saving, because we are going to be increasingly able to put on to a chip the size of a postage stamp properly connected electrical circuitry which would previously have required great assemblies of machinery that would fill a room. Amazing savings in energy can be secured by even a small staggering of working hours (why not let Britain south of the Trent—but not north of it—go back to British Summer Time this winter?).

Above all, the greatest of the three main transport revolutions since the 1770s is now speeding towards us. It will clearly replace the internal combustion engine revolution as dramatically as that revolution replaced steam, and it happens to be extraordinary energy saving. This great new transport revolution is telecommunications. Because the businessman's future essential tool, the computer, talks to other computers by telecommunication, instead of by taking a walk, much of present business travel and then personal travel to work are going to become unnecessary in the main growth jobs in post-industrial societies. Even in the 1970s some of this travel will be replaced by a great growth in telex transmission, facsimile transmission by telecommunication, picturephone, etc. As there is no logical reason why the cost of telecommunication should vary with distance, quite a lot of people by the late 1980s will telecommute daily to their London offices while living on a Pacific island if they want to; and temporary price rises for oil-driven travel in the early 1970s will now bring a few of these habits forward.

Some critics say: "Which of these science-fiction inventions do you really expect to be operating within six of seven years?" The *pons asinorum* of economies is to recognize why that question is absurd. If you were so foolish as to try to draw up a computer model of energy economics over the next 6–7 years, you would have to combine the thousands of possible ways of producing energy, and of possible ways of changing distribution systems and consumption patterns for it, together with estimates of time lags for each, and today's prices for each, and of guessed elasticities of supply and substitution for each, into an equation with multibillion factors.

Governments which produce "energy policies" do not work with multibillion-factor models of this kind, but with the guesses of perhaps three boffins (scientific experts) and a minister—which is why such policies have no serious chance of being right.

Apostles of a free market say that it arrives infallibly at the best possible answer to the multibillion factor equation. Actually, it usually does something much less perfect but still rather useful: a free market will generally bring the mix of production-consumption-distribution patterns within the spectrum of the "several million possible answers" which are not wholly incompatible with the multibillion factor equation.

If you then change some price in the system rather marginally, a different but overlapping spectrum of "several million possible answers" replaces the present spectrum; if the market has already rather haphazardly chosen one of the answers within the overlap, then neither production nor demand will change with the change in price, and both supply and demand are said to be surprisingly inelastic over that range of price. But if you change expectations about the price of the most important present energy source, namely oil, from under $3 a barrel before this autumn to a level where people and governments and profit-seeking enterpreneurs actually believe that it is going to be over $12 a barrel or $17 a barrel (or whatever is the figure that the latest hopeful Arab or temporarily panic-stricken auction bidder last thought of), then people and governments and profit-seeking entrepreneurs suddenly believe that billions of possible new answers will be more profitable than which ever one of the "several million possible answers' is the one most people are using now. If other factors remained as now, they would be more profitable; but other factors won't remain as now, because the new ventures will themselves change them.

It is because you cannot get many quarts into a pint pot—or an expectation of billions of possible answers into a situation where only a changing several million answers will at any one time be possibly logical—that forecasts of lasting shortage generally do lead nowadays, within a short time span, to embarrassing glut.

It is always most difficult to persuade people within the particular industry and within the scientific establishment to see this, because all their habits of thought are geared to the relationships existing within the multibillion factor equation now. So the only proper answer to the *pons asinorum* question "Are you relying on advances in magnetohydrodynamics, or solar energy, or fusion, or what?" begins "Well, now, an improvement in magnetohydrodynamics would affect the multibillion factors in the energy equation in the following multi-billion ways." No economist can give that answer, because (a) no economist is clever enough, and (b) he would anyway be dead before he reached answer number multibillion minus one—and a hundred-year time for answering a question about what to do in *the next* seven years is not very useful.

What an economist can say is that the recent wild changes in expectations about oil prices will lead to an energy glut, within a debatable time span, according to all that has been known up to now about the elasticity of supply for energy.

The most respectable argument on the other side is that the time lag may nevertheless stretch beyond the end of the 1970s, because of a supposed long lead time before changes can come into effect (which is true of some of the investment, but most unlikely of economies in demand), or (this is a better argument) because the elasticity of substitution from an oil-based to an another-energy-based system will be low since people are romantically in love with the expensive oil-using machinery such as motor cars which they possess. There are three answers.

First, the speed of change has in fact been very quick in the downward direction. People forget that from 1963 right up to the early 1970s the "oil

question" in America meant that you should not allow Texas oil millionaries to make so much money. Indeed, it was this trendy populism in America in the past decade which created much of the present temporary energy "crisis." In 1964 American courts compelled a quite unprepared Federal Power Commission to regulate for the first time the prices charged for natural gas; by 1970 the FPC had a backlog of over 2,000 producer rate cases in natural gas, which would have taken 13 years for it to give answers to. The price allowed for this environmentally clean and premium fuel was therefore so low and out of date that it not only made more production of natural gas uneconomic, but also distorted the market for other fuels and cut investment in them at just the wrong moment. Through the years of gathering crisis, the price of gasoline in America was about half the price of petrol in most other countries.

In President Nixon's first budget, as late as 1969, there was universal acclaim when he cut drilling for oil through reducing the rate of percentage depletion allowances for oil and gas from 27½ to 22 percent. Then in 1970–72 environmental restrictions were directed most especially against the energy industries. By 1971 fewer exploratory oil wells were being drilled in America than at any time since 1947. One reason why Mr. Herman Kahn and others think that it is going to be very easy to step up output of energy in America is because they are among the few who remember that almost everything has been done for a decade to bring it down.

Secondly, the very low figures usually published for oil reserves round the world are mostly reserves discovered in days when just about the only known way of striking oil was to get a Texan to go and sniff for it. There really is now a must greater, and still expanding, ability to find the stuff by electronic senors attached to computerised systems.

Third, it will gradually be realised that the mechanism through which the price of anything is determined—including oil—really is a bit more sophisticated than an Arab saying what he wants for it. So oil's price should come down rather sharply well in advance of the energy glut which its price rise this winter will not create; but this is unlikely to be in time to stop the energy glut, because the new investment and habits will already be in train. Until this winter, it had seemed marginally likely that the oil price would rise in 1970–80 by more than most other prices; the main consequence of the past three months is that it will now presumably rise by less.

Most of this article should not be regarded as good news for Britain. A main implication is that Britain's North Sea oil "bonanza" may very well come on full flow just when oil is coming towards glut. Another is that the 1 billion pounds being spent on Britain's coal mines will be wasted, because it will be surprising if by the mid–1980s any man-operated coil mines should remain open at all.

A more tragic implication is that the most deserving charity of Christmas, 1980, will probably be to relieve Arab states ruined by their monoculture of unwanted oil—a charity which is likely to be mainly subscribed by rich Jews Not enough tears seem to be raised by that.

This article is reprinted, by permission, from The Economist of London. The magazine describes it as "a new year prophecy that sounds unconventional, but has a good chance of proving right."

Chairman PROXMIRE. Congressman Conable.

Representative CONABLE. Thank you.

Mr. Nader, I would like to apologize for my temporary absence. I have been briefed by the staff on some of the things you have said.

I would like to say also that you speak with a strong and an important voice and that you have made a great many contributions in this country, citizens contributions far beyond that of any other private citizen I know. I compliment you on your diligence and your attention to the Nation's business in this capacity.

I would like to know—first of all, Mr. Nader, have you described your sources of information about the oil industry? We have a good deal of criticism of the Government for its reliance on oil industry statistics. It must be difficult to check these statistics and I wonder

how you go about finding what you need to know about the oil industry.

Mr. NADER. Well, several ways. First of all, you analyze internal consistency of the official data. For example, if you want to know what proven reserves are you say what is your definition of proven reserves? If they say it is a function of the economic level and technology level you say when was that function dated? Was it dated 1955, 1960? Does it take into account new drilling technology and new economics? When you make these kinds of probes with both Government people and geologists and others they will admit that the amount of proven reserves reflecting recent prices and technology over the last 10 years is enormously greater than the 36 billion barrel figure that is given for this country.

Representative CONABLE. Do you not get rather a picture of inaccuracy rather than of the direction of that inaccuracy in most cases?

Mr. NADER. You get a picture of inaccuracy, of underestimation, and an idea of the order of magnitude but you do not get enough to say, this is the exact figure. But if you are working on order of magnitudes like five times the official figure, and some would even go higher——

Representative CONABLE. Might not in some cases it be five times less than the official figure?

Mr. NADER. No, because the oil companies would not want to engage in overestimating reserves if only because they pay more taxes. They pay more property taxes and other assessments.

Representative CONABLE. I asked Mr. Simon about that and he said he was going to look into this when he got to Texas where they have no income tax and the real estaate tax is rather burdensome, I suspect, on the oil companies.

Now, you have talked about breaking up the oil industry. I take it that you are talking primarily about breaking it up along vertical lines, as you said. Will that not increase costs? In fact, most companies go into vertical organization in order to cut out middle men, in order to cut out independent profitmaking agencies that usually, because they are somewhat less efficient, tend to be, therefore, more expensive ultimately for the public. Acknowledging that monopoly is not a desirable condition, is not the result of breaking up vertical integration likely to be more slack in the pricing process generally?

Mr. NADER. I think vertical integration, which is officially justified on the basis of efficiency has basically become a way to knock out the competitors and to preserve the power of the major oil companies. Let me give you an illustration.

Representative CONABLE. One of the greatest dangers, incidentally, I acknowledge at this point is that all the independents are going to be gobbled up in the process of trying to administer this shortage if such there be.

Mr. NADER. And if there is any source of competition for the majors, it has been the independents, both at the retail and the refining and producing areas. If you are an independent oil producer, and you want to get your oil to market, you want to get to a pipeline. That pipeline is owned by a consortium of majors. It is

supposedly regulated by the ICC which has never regulated oil pipelines for decades and if that consortium can make your business miserable in terms of not giving you the right time to put your oil into the flow or increasing the price or giving discounts to the owners of the pipeline, they can keep you off the market.

That is why economists who have studied this area in the antitrust context put such a high priority on separating the pipeline. Others put a high priority on separating crude production in refining. But I would go further than simply deintegrating vertical integration. I think the companies, the seven large companies, are a kind of shared monopoly and need to be broken up into smaller units to begin with.

You know, it often amazes me how with a straight face a Government official can say that there is information that has to be kept confidential from the American people that the Government gets from the oil industry. I would state that there is no information from the oil industry that the Government obtains or will obtain that should be kept confidential, for several reasons. If it is national security, what are they letting BP and Shell in for? They are foreign companies. Not to mention the multinational companies. If it is confidentiality, if the Government applied the following rule it would release all the information to the people. That rule should be that the Federal Government will release all information to the American people about Exxon that Texaco knows. They just can apply that standard. Sure, it is a cruel joke to represent to the public that the oil companies are giving them confidential information to the public that the oil companies are giving them confidential information on a trade secret justification when they collude through many joint ventures, the American Petroleum Institute and the American Gas Association with that very same information. How can they share it with their trade association and then say: "Well, we will give it to you finally, U.S. Government, but do not give it to the people because it is a trade secret."

Representative CONABLE. As I go down by Main Street back home I get the impression that there is a gas station on every corner and that there is a rather vigorous competition at the retail level and that in fact the American public calls gas stations rather quickly to account when they get outside the pattern of pricing the American public feels is reasonable. Now, how about that? Does not retail competition have the effect of policing the industry to some extent? There may be only seven or eight total oil companies but they certainly are competing for the ultimate American consumer dollar.

Mr. NADER. The competition flows from the stick of the independents held over them or when they undercut their prices when they used to get surplus refined petroleum products. I think Mr. Allvine has produced definitive work here, and is going to testify this afternoon, and will be able to reply to that question in great detail. Studies by both the small business committees and FTC and other agencies has been that although there are a lot of gas stations, that the competition comes from the independent gas station, both deterrence and actual, rather than between Texaco and Mobil distributors who communicate price levels right at the retail area. That has been shown. They as well, mix each other's branded gasoline.

Representative CONABLE. If there is no competition, how do you account for the much lower retail price of gasoline in this country than in the rest of the world? I acknowledge that the rest of the world depends to a much greater degree upon Middle Eastern oil which has had a dramatic increase but for as long as I have been aware of gasoline prices abroad, they have far exceeded ours and I wonder if there is not some element of competition then in the lower American retail price of gasoline.

Mr. NADER. Yes. There are several reasons for that. One is the enormous taxation in Europe that comprises their so-called dollar a gallon of gasoline. You have to discount the taxation that increases the retail price.

Representative CONABLE. Some of them are nationalized distribution systems are they not?

Mr. NADER. Yes, but still taxation. But second, Europe is not much of an oil producer, although it is beginning to be in the North Sea. The United States is a very large producer. There are more independents in this country. It is the phenomenon of independents that explains a great deal of the difference, in reply to your question, as well as the phenomenon of much greater taxation by the European governments on gasoline.

Let me just make one point in this context as a reflection on the sincerity of the oil industry. If the oil industry really wanted to reduce demand, one thing they would do is become crusaders for automobile and usable gasoline station price posting for octane levels. Now, the Cost of Living Council under phase IV requires a particular posting of octane levels but it is on a formula which is not comparable to the information that the motorists get on buying their automobiles and looking in the manual.

Let me just give you one stunning fact here. If the people were not overbuying in octane, because they were given adequate information about what their automobile can use, they would be paying as of last summer 5 cents less per gallon of gasoline and there would be far—there would be considerably less pressure on refineries because I think the figure is the following. This comes from Oil Daily. The Oil Daily states that lowering the octane rating by a single number enables oil refiners to produce up to 5 percent more gasoline. Just by a single number. So if all the cars in this country just bought the octane level that is suitable for their car, the refineries could produce a good deal more gasoline.

Now, if the oil companies were candid and really sincere, that is where they would put a lot of their emphasis.

Representative CONABLE. Thank you, Mr. Chairman.

Chairman PROXMIRE. Mr. Nader, thank you very much. You are a marvel. I do not know how you know all of this. It shows what one mind can do when it is not engaged in the kinds of trivia that amuse the rest of us.

Thank you very, very much for a fine performance.

The subcommittee will stand in recess until 2:30 this afternoon when it meets with Fred Allvine, Joel Darmstadter, and David Freeman.

[Whereupon, at 1:10 p.m., the subcommittee recessed, to reconvene at 2:30 p.m., the same day.]

AFTERNOON SESSION

Chairman PROXMIRE. The subcommittee will come to order.

This afternoon we are very fortunate, we have three really outstanding experts in this field. Mr. Fred Allvine, energy consultant, and specially an expert in the retail area, who has written a book on marketing gasoline; Joel Darmstadter, who is also a distinguished author and expert. He works now in the Resources for the Future. David Freeman is an old friend of the committee. And, of course, he is from the Ford Foundation Energy Policy Project, formerly with the Federal Power Commission.

Very happy to have you gentlemen.

We will start off with Mr. Freeman.

STATEMENT OF DAVID FREEMAN, FORD FOUNDATION ENERGY POLICY PROJECT

Mr. FREEMAN. Thank you. I am pleased to be here. In a sense, the situation we find ourselves in today with our lack of information about the operations of the fuels industry is analogous to the situation in the thirties.

Chairman PROXMIRE. Let me interrupt to say that we have no copies of your statement. That is understandable because this hearing was called on short notice. I would appreciate it if you could confine your remarks to 10 or 15 minutes, then we will have questions.

Mr. FREEMAN. Yes, sir, I will be delighted to.

The situation today is analogous to the situation we found ourselves in in the thirties with respect to the utility industry. Then, after a massive investigation by the Federal Trade Commission, there was enacted the Federal Power Act. There was a uniform system of accounts established for the electric utility industry based on pioneering regulatory work in the State of Wisconsin, I might add. We began to get an even and steady flow of public oriented facts about the electric power industry.

Today we need such a fundamental reform with respect to our ability to extract information from the fuels industry; not only extract it but compile it, digest it and make it available to the public in a meaningful way.

If one starts in the ground, which is perhaps a pretty good starting place, we find that we don't know what is there. And it is not just the oil industry that one must point the finger toward. The Federal Government which is the owner of most of the economic fuels left in the ground, turns out to be a very, very poor storekeeper. We haven't spent the money or taken the effort to find out what the people own, not in the outer continental shelf and not out in the West with respect to the massive coal resources. We are amazingly deficient in knowledge of the quality and quantity of the fuels that the people of this country own.

And when one thinks of the hundreds of billions of dollars that are coming into the Treasury from the sales of the right to exploit these fuels in recent years, and the fact that little of that money is being spent to find out what else we have, we get some idea of the magnitude of the neglect.

After we lease the land, which is really a fancy word for selling the mineral rights therein to the oil industry, we as a government don't have a very good idea of the pace at which those leases are being developed. Our capability for evaluating the development program is meager.

The third point I want to make is we are in a situation where a lot of people believe the industry is probably making extraordinary profits, windfall profits. And yet all the years that I was in government in energy policymaking positions and even today I have been unable to find out the cost of producing oil in the United States. The Government doesn't know, as far as I can find out, and the public doesn't know whether producing oil in the outer continental shelf or anywhere else costs $2 a barrel, $3 a barrel, or $4 a barrel, or $6 a barrel. We have to guess at what the size of the profit margin is and whether the country needs prices higher or lower than the prices that are in effect in order to provide a reasonable margin to encourage exploration and development.

It is maddening in a sense to think that these are resources that the Government owns, that it sells to the industry, and that we don't even have the commonsense to extract conditions that would require the cost information be made available to the Government and of the people of the country.

We have no knowledge of the timetables for building refinery capacity in this country. The oil industry has no legal obligation to build refineries. Their legal posture is no different than the grocery business in that respect. They build, if it meets their economic criteria. The country is traveling, I think, without any real understanding, without any real knowledge of whether gasoline shortages will continue in 1975 and 1976 and 1977, no matter what the producing nations do about supplying crude. We would have had a gasoline shortage in this coming summer anyhow, and these shortages are apt to persist indefinitely unless there is some public interest oriented game plan for building refineries.

Now I can understand that an oil company might have questions about going ahead with refinery construction in view of the uncertainty of crude supply. We have to get into the issue in a much more meaningful way than simply a guessing game as to whether the oil industry is going to build or not. We have inadequate information, in my opinion, as to what the oil industry does with the money it receives. And we could go on almost indefinitely in this tale of traveling in the dark as far as policymakers and the public is concerned. This is a basic fact about the industry.

I return to my opening comment, Mr. Chairman. I believe the time has come for something much more fundamental than simply filling a gap here and there in terms of spot items of information that might be missing to some of this week's dilemma about this industry.

I believe that it is time that we have a basic bookkeeping system for the industry that will provide a basis for meaningful information, that information be channeled continuously to an agency of government with sufficient staff and public interest orientation to digest the information, make it available to the policymakers and

the general public on a continuous basis, something analogous to the Bureau of Labor Statistics.

I thank you, sir.

Chairman PROXMIRE. Thank you very much.

Mr. Darmstadter, please proceed.

STATEMENT OF JOEL DARMSTADTER, RESOURCES FOR THE FUTURE

Mr. DARMSTADTER. Thank you, Mr. Chairman. I also have no prepared statement, but I do have some notes. I though I might contribute to a balanced presentation by touching on some of the analytical gaps in our knowledge about energy. This is not because I think the problem of current data reliability is unimportant but because some of the broader aspects of energy information deserve airing.

One way of exposing or illustrating the deficiencies in the energy data-base is to cite some of the more incessant questions being asked by people trying to understand the dimensions of the current energy crisis and policies designed to deal with it.

Of course, our basic data system shouldn't be unduly governed by random, if precipitous, events like the Arab embargo. This could drive us paranoid; on the other hand, some of the quantitative questions being asked in connection with the current oil crisis may well have a more enduring importance, so that by using the current problems in energy as a jumping off point needn't be an exclusively short-term reflex.

One question being asked these days is just what is the disposition of energy utilization in the United States? After all, if we are exhorted to reduce thermostat settings, to drive more slowly, and to dim lights, it would be of more than casual interest—to policymakers and others—to know just what the quantitative importance of these components of energy use in the United States is. (It turns out, incidentally, that household lighting is probably a very minor fraction if residential energy use, let alone the national total.) I don't dispute the demonstration value of exhortations with respect even to insignificant energy sources. But I do think that a far more discreet statistical breakdown of U.S. energy usage would be most desirable. The raw materials for such a system in the form of census and other data—are probably there. But so far the Bureau of Mines has contented itself with exceedingly broad and aggregate sectoral statistics, and only a one-time study commissioned by the Office of Science and Technology a couple of years ago made any sort of a start toward development of a detailed statistical picture of energy consumption in the United States.

Another area is foreign trade statistics. Just what is our dependence on Arab oil? There is really a lot of guesswork about this. Much Arab oil reaches us indirectly through European and West Indian refineries, and given the logistical ingenuity of the oil companies at diverting, rerouting and whatever else is being done, much information simply is not captured by statistical data. More specific origin-and-destination data and more comprehensive information

about foreign operations of oil companies in general would be most constructive.

The third point is that we know next to nothing about regional energy uses and requirements. I have myself tried for the past year or so to look at the total energy picture in a large metropolitan area—in this case New York City and its environs—and here, except for gas and electric utility data, there is virtually a total void in our quantitative knowledge about energy. The interest in this kind of information is apt to be more than transitory. It impinges on such questions as pollution and emissions from different energy uses, the private-public transport mix, and saturation of energy using appliances in the region. We would gain considerable insight into the potentiality for further energy demand growth, for powerplant siting requirements and numerous other questions of essentially a regional nature.

Today, we simply don't have adequate regional energy data, and there is too much guesswork about such issues as the regional impacts of shortages, fuel and power. In other words, I'm calling for the kind of information needed for a much more enlightened policy-making on a subnational level.

What I have given you so far are examples of mobilizing essentially raw data which would be useful even without a great deal of further analytical transformation. As we get into things that have a more analytical cast, the following topics come to mind.

There is obviously intense interest right now in the employment and industrial impacts of energy shortfalls. This is the kind of question that seems to point to interindustry—input-output—analysis, except we need much more discreet information than the standard I–O coefficients now available.

We need to translate the dollar information in input-output tables into physical flows. We need to know much more about what goes on within specific cells of the input-output matrix of interindustry purchases and deliveries. In particular industrial establishments there may be far more potential for saving on energy utilization when the energy is used for space heating than when it is required for an electrolytic manufacturing processes. The aggregation of our interindustry matrix is simply too gross to permit us to identify such distinguishing characteristics. But without the information impact analysis and allocative decisions are hampered.

The scope for substitutability between scarce and abundant fuels in particular industry groups is another property which standard I–O tables fail to disclose. Obviously, this calls for an exceedingly high degree of disaggregation and I have given no thought to the cost-benefit limits to a substantially expanded input-output effort yielding more detailed information. Again, however, the intense longer-term interest in energy conservation, self-sufficiency and resource management points to an energy slanted input-output effort as probably warranting a pretty close look.

Another analytical tack that needs to be pursued is the question of the demand response to rising energy prices—especially for electricity and gasoline. Once again this has topical as well as longer run importance. As you know our whole experience has been with

37-143 O - 74 - 13

low and falling real fuel and power prices in the United States and the little bit of economic work done to date has necessarily been constrained by data cast within this historical setting of abundance and low costs. Clearly much work is needed in this area for facing up to public policy questions.

Then, finally, there is the ever-present question of the utility or futility of energy projections. I do believe that an ongoing and systematic effort at short- and long-term forecasting would be most desirable. These kinds of projections should embody the best explicit demand and supply response to price that can be developed.

On the supply side, particularly, this would quickly expose problems connected with the systematic development and standardization of reserve and resource concepts—statistics which Mr. Freeman has alluded to.

I will be glad, Mr. Chairman, to get into other questions that may be of interest to the subcommittee later on. Thank you.

Chairman PROXMIRE. Thank you very much.

Mr. Allvine, please proceed.

STATEMENT OF FRED ALLVINE, ENERGY CONSULTANT

Mr. ALLVINE. I would like to talk about my general reactions to what I heard this morning and, I think, some real salient questions that need to be considered.

First of all, I think that Energy Czar Simon and Consumer Advocate Ralph Nadar asked more questions than they answered, and I think many of us, me included, are getting bogged down in a quagmire of industry statistics. I don't really know how short we are and I think that is one of the real reasons for additional information.

I endorse generally the nature of the statistics that were suggested by William Simon. I would point out, however, that industry has historically fought every effort to provide the Government with the type of statistics which are being asked for today. This was to keep the Government from becoming too involved in industry activities leading to perhaps to more control.

I had calls from Government agencies within the last year asking me if I couldn't do something to get industry to cooperate more in the statistical area.

With that setting I would like to point out though that I don't think too much should be made of statistics because statistics will not solve any problems and we can be misled and direct our attentions in the wrong way. There are some real significant questions we need to get into.

For example, this past week an oil company released information about the condition of inventories. This information was almost meaningless. It didn't really help the public to understand and comprehend anything. You don't sell from fundamentally inventory, you sell from production. If they told the public what they planned to produce in February, March, and April, then the public would have some idea where we really stand with regard to shortage. So I think the public can be misled by the presentation of a great deal of mumbo-jumbo statistics which don't lead to any direction.

I would like to move on to what I think is really the issue before Congress, and the issue before Congress is that we don't fundamentally have any petroleum policy in the United States. You have along with other Senators delegated some responsibilities and now are considering an energy bill to delegate more responsibilities to the White House to make decisions that I think are your responsibilities and I would like to be more specific about the areas where I think Congress needs to look very carefully where we have come from and where we want to go in the future. I don't think necessarily that today the interest of the international oil companies with great influence at the White House are necessarily those that coincide with the general public interests.

Let's take one thing, for example. The foreign tax credit. The foreign tax credit as I understand it is working out today is robbing the Treasury. It has resulted in international countries swooping in and taking the tax dollars that these international organizations would otherwise be paying to our Treasury from investments in the United States. This is going over to the Middle East. What we are doing with the foreign tax credit as it exists, they were subsidizing the Middle Eastern development of oil and that oil is being embargoed against the United States. I think if the public recognized what this tax policy was doing there would be a public outcry. So I hope you and others will look at tax policy and particularly the foreign tax credit. Once when foreign oil was low there was justification. It is contrary to our own national interest. And while you are looking at that, look at the depletion allowance. Already there has been a break in the dike. Atlantic Richfield has come forward and advocated it be eliminated, prices be allowed to increase and it would be a natural way to cut back on some of the demand. No longer are energy resources cheap. What we need to do is let the prices go naturally, quit subsidizing the price of the petroleum and other fuels, let the price rise and let that curtail demand.

Let me move on to one other area where I hope that you will commence to look in terms of broader energy policy, not just a question of information but energy policy, petroleum policy. Right now it is your interest to get on with the job of developing indigenous petroleum reserves. We need to improve our resource base in this country, particularly in crude oil and natural gas. If we look at the policy coming out of the White House now delegated to them we can look at the leasing of offshore land for development. That is where our future lies, as Bill Simon told us this morning, and what policy is being advocated? We have a bonus bidding system which is driving up the cost, increasing the prices and really discouraging exploration and development in the United States. Furthermore, it is a policy that has been advocated by some of the giants of the petroleum industry to keep the little smaller producers out of this vast new recourse. What we need to do is have an energy policy which is set up which is uniquely American which will get on with the job of developing our own petroleum resources. And the bidding system is not one to drive up the cost, it is forcing the two-tier price structure to occur in the United States and reducing the profitability and necessitating increased cost, and I think this is another aspect of policy that has to be looked into.

Then we go into some other things. This morning Bill Simon was telling you that we have price controls. That is so much malarkey. We don't have price controls in the country. Only at least 50 percent of the production. That is a smoke screen. I don't care what anyone says. We have to come up with a two-tier price structure. The best thing the Government got out of the price control, two-tiering, all of this business with regard to trying to regulate petroleum prices. I think what we need to do is let the prices go and use some sort of tax base for seeing that unfair return is not brought to the industry, but I think everyone has to recognize industry needs. It may be wrong for me to say increase profitability to get on with the job.

It comes to the final question you raised this morning, what do you advocate? You advocate a policy nationalism, you advocate a policy of public utility approach, or do you advocate a policy of free enterprise or antitrust enforcement? I think I side with you, Senator. Maybe I am ideal but what I would like to see is more competition in the industry. With government interference, look what happens when government becomes involved in policy. It is subverted to the interest of the powerful few, and what I would like to see is a change made in the industry which will help to restore the competitive process so that profits are used to develop the U.S. resource base.

Thank you.

Chairman PROXMIRE. Thank you, Mr. Allvine. These are certainly stimulating viewpoints.

This morning Mr. Simon stressed the inevitability of a fuel price rise. He feels apparently there is a limit on what the Government can do to limit price increases, and Mr. Allvine certainly underlined that with his observation that we have just heard, even though the Economic Stabilization Act provides a very broad price control authority.

I would like to get your reaction to the following point. First, what is the price increase needed in the long run in order to bring forth fuel supplies from new sources such as shale oil or coal gasification?

Mr. Simon has zeroed in on $7 per barrel of crude oil, yet he also indicated that it may be possible to produce oil from shale cheaper than that.

Do we have the data necessary to know what the various types of new production might cost us?

Mr. FREEMAN. No, sir, we don't. My testimony this afternoon represents just my personal views on these matters.

I happen to believe that we need a rollback of prices rather than further increases. The price of new crude oil in the United States is $10 a barrel. It is too high in my opinion, much too high, and I happen to believe that consumers of this country are paying much too much for oil today. The price increases that have been allowed in the last couple of months bear no relationship to the cost as far as I have been able to find out. A dollar a barrel increase on crude oil that was authorized, in fact suggested by the White House just before Christmas, amounts to approximately

$3 billion a year in my gasoline bill and your gasoline bill and everyone else's. This is on crude oil that has been discovered long ago, and as far as I know the price of producing that oil didn't go up a penny over the Christmas holidays.

Chairman PROXMIRE. Mr. Simon argued secondary and tertiary development might be influenced by an increased price at the established wells.

Mr. FREEMAN. It is my judgment if you want to get secondary and tertiary recovery that you don't have to pay the $7–$8 a barrel on all of the oil that is already flowing. Let's develop a very sharp tax incentive, a depletion allowance that would apply to the secondary and tertiary recovery in an amount needed to make up the difference in cost. The idea of permitting a very high price on all of the oil flowing just to get another 5 or 10 percent strikes me as a very bad bargain for the consumer. I would like to know what the costs are so that we can have prices that will permit a generous return, not an extraordinary return. This is a multibillion-dollar issue for the American people that needs to be debated and not decided on the basis of ignorance about what the facts are.

As far as what price is needed to encourage the development of aletrnatives, I don't believe there is anyone in this country that knows for sure today because most of the questionmarks about the shale, for example, are about the environmental impacts. We have to build a demonstration plant, in my opinion, and get some hard data to find out.

I worked in the White House Office of Science and Technology for years evaluating these new technologies. They all looked fairly attractive on paper, but without exception they become much more expensive and very difficult when you try to implement them, I don't think that fixing today's prices for oil and gas discovered years ago on the basis of some guess as to what the market might require for bringing in new alternative sources is a very good bargain for the American consumer.

Chairman PROXMIRE. Mr. Allvine, you came down hard on the side of relying on the market to do the job and competition to do it. Do you feel that we can dispense with price controls now or we need a short-term transition at least while we——

Mr. ALLVINE. I think all we are maintaining, Senator, is a facade of price control. I don't think we have price control.

Chairman PROXMIRE. You said we have price controls on 50 percent and not on the other 50 percent.

Mr. ALLVINE. On the other 50 percent they boost that to whatever is needed to make up the difference. They have a passthrough so they can take their transportation differences and now make one——

Chairman PROXMIRE. Are you arguing the best policy would be to eliminate the price controls?

Mr. ALLVINE. I truthfully think the more and longer the Government fiddles with measures like this the worse the situation is going to be. I would be very much opposed to the suggestion of Mr. Freeman and Ralph Nader, we roll back prices. We will have a hell of a shortage in the United States. Maybe we should go to the excess profit tax if we get to playing around with the price

mechanism and you have to realize that I am opposed to how we got into the shortage to begin with. I don't think it was a natural phenomenon. I think it was encouraged in part by business and Government oversight.

Chairman PROXMIRE. What would happen to prices if we followed your advice and took off price control entirely?

Mr. ALLVINE. I would really be surprised if we took off price controls on the other 50 percent to see much happen to prices. The rate of return might go up. I would be surprised to see the overall average price of crude oil go up any higher than it will anyway. It is going to happen. Whatever is needed to accomplish the goals of increased exploration of producing to give the petroleum companies the capital flows necessary for them to restructure their industy is going to take place, we don't have any control.

Chairman PROXMIRE. The point Mr. Nader and the point that seems to have validity is that a strong element of competition did help hold down prices, and that was from the independents, the independent marketers, independent refiners. They have been squeezed out. To a considerable extent they are pretty much at the mercy of the majors for the crude in the case of refiners and for their products in the case of the marketers.

You really feel under present circumstances with the limitation on imports that we have, because of the embargo, if you took off price controls now that prices wouldn't go much higher?

Mr. ALLVINE. Senator, as you know, I am very concerned about the position of the independent refiners and marketers and their being squeezed and many are being murdered at this particular point in time. We also have the other problem here of improving our domestic energy base and we have to have adequate incentive to accomplish. One thing I don't want to do is destroy another. What I would do in your information bill and what I had in my statement and forgot to mention, one bit of information should be forced out, I doubt it will come forward, and that is rate of return on down stream refining and marketing operations. That is how they squeeze the independent. They are subsidizing this end of the competition to squeeze the major source of private competition. I would hope one thing in the information bill, it would have to break out the super secret information about how they subsidized downstream refiners and artificially squeeze by administering the——

Chairman PROXMIRE. Do you think the information can do it or do you think we have to reduce the integrated power. Congressman Conable pointed out this morning if we eliminated integration there might be an increase in cost. But, on the other hand, if you eliminate integration you would have a greater degree of strengths on the part of the independent refiners, you wouldn't be at the mercy of the situation. As I understand it, the way the oil companies operate they can charge themselves whatever price they wish, of course, so they charge themselves a nice high price for the product they sell to their refinery that increases the value of their depletion allowance, also discourages any refinery competition, and narrows the margin for the refiners. As long as you have vertical integration they will have the power and incentive to do this.

Therefore, should you have to have the Anti-Trust Division break it up the way they did in the shoe industry, break up vertical integration?

Mr. ALLVINE. Your first question is would it be more efficient if we had an industry that wouldn't vertically be integrated? I would argue it would be more efficient, not.

Chairman PROXMIRE. More efficient to have——

Mr. ALLVINE. Because of the wasting. Do not result in the proper allocation of resources. The second point you raise is with regard to, do we have to have divesture, and there are two types of divestures. Fiscal divesture where we lop off crude oil. We have functional divesture where we require clearcut separation in an accounting type of sense so we can see what is taking place, and the lesser of the problems would be bringing that functional divorcement in the accounting system so we actually see where they would stand and it would be difficult for them to come forward and say we need another dollar a barrel increase. If they had another dollar why are you holding——that exerts pressure back on them now. What I think structurally is needed but I don't doubt if we will ever see separation of crude oil from downstream activities severed, cut off. Make them separate industry. This industry unlike the metal industry, film, is integrated, which leads right on through to the gas pump. That is where we are getting many of the problems today. That is why we have four times as many service stations as we need in the United States. We are getting all of the disfunctions coming out.

The public has not prospered under this. So I think we can do it functionally or physically. If there is not enough guts for someone in Government to stand up and make the oil companies report earnings on the market, earnings on distribution, then we might as well go all the way to get a resource base restored in the United States so we are not subservient to some middle eastern sheik and let the downstream restructuring and let the market systems cave in.

Chairman PROXMIRE. I would like your comment, Mr. Darmstadter, on what your colleagues have said and also whether you think the profits must go much higher than presently in prospect to fund their necessary investment. Just how much more resource and oil exploration can be physically conducted?

Mr. DARMSTADTER. I'll limit myself to the following observation. An important distinction has to be made between, on the one hand, the short-term price of oil which the scrambling among consumers is now driving to unreasonably high levels, and, on the other, the long-term cost of now reserve development and greater producible supplies of oil and gas in the United States.

There is no question that some of the current market prices for new oil are probably in substantial excess of a long-run equilibrium price which would elicit a far greater degree of indigenous petroleum producing capability in the United States. The point is that the flow of oil resulting from development of additional reserves in the United States inevitably is going to take a matter of years, so that there has to be some mechanism by which producers are

assured of a satisfactory level of return and adequate price over the long run—inducing them to undertake the development of these new reserves—without at the same time generating enormous windfall profits over the short run for flowing oil. But I offer no particular judgments about the specific policies that are most conducive to performing the degree of fine tuning that is here needed.

Chairman PROXMIRE. A policy developed without getting government in it is pretty massive and complicated.

Mr. DARMSTADTER. Pardon me.

Chairman PROXMIRE. What you are asking we do is to provide an assurance to the oil compaines sufficient to warrant their investment that the price will be adequate to give them good return over a period of years but at the same time not an excessive price in the short term which is unnecssary?

Mr. DARMSTADTER. That is right.

Chairman PROXMIRE. And give them a short-term windfall.

Mr. DARMSTADTER. Yes, sir.

Chairman PROXMIRE. How do you design that kind of thing without squeezing out of the free market? It is pretty hard to do.

Mr. DARMSTADTER. I really don't know. There are suggestions about coupling some of the benefits of higher prices with variable scaled excess profit taxes. I don't know whether the proposal that originally appeared in the Senate bill in December was the ideal approach or not. There are additional proposals for coupling the retention, if it is to be retained, of the depletion allowance with a willingness by the companies to plow back funds into development of new reserves. There is the additional necessity for simply trying to determine what is actually the long-term equilibrium price that will elicit the quantities that will achieve some reasonable degree of self-sufficiency for the United States over the long run, and there I agree with Mr. Freeman that we are confronted with an enormous amount of uncertainty. Yet I should point out that on the basis of some speculative, but at the same time fairly serious research work that we have done at Resources for the Future over the last several years, it does appear that an equilibrium price—in today's price level—of something like $7 a barrel of oil in the long run approximates the level needed to elicit substantial increases in the development of new reserves of oil in the United States. It also appears, subject to the qualifications that Mr. Freeman introduced about our uncertainty about the environmental constraints on oil shale and doubts about whether this technlogy is going to work or not, that the price of oil from shale is likely also to find itself hovering around this price of $6.50 or $7 a barrel of oil. These are not too far from the figures that come from Mr. Simon's office.

Another kind of safeguard that has to be reviewed in turning these prospects into reality is some assurance about future U.S. oil import policies. We know that the price of imported oil currently arriving in the United States is perhaps $9 a barrel. It is vastly in excess of what it costs to produce expending quantities of oil in the major producing oil regions of the Middle East and North Africa. There is no assurance that if we embark on a serious and substantial effort to increase our self-sufficiency by exploration, development

and produceability of reserves in the United States, that the domestic price will not be undercut by foreign producing countries once electing to reeenter the U.S. market on a very substantial scale. So I think that if we expect American companies to divert their exploratory and developmental activity from elsewhere in the world back to the United States there has to be some mechanism that assures them of a reasonable protection from foreign competition in the future.

Chairman PROXMIRE. My time is up. Congressman Conable has permitted me to let Mr. Freeman reply too.

Mr. FREEMAN. Mr. Chairman, I would just like to add this thought. I don't believe that it is possible to eliminate the Federal Government from very deep involvement in the future of our energy supply and demand situation. Most of the remaining oil and gas that is economical to be found is on Federal land and the supply for the future is going to come from a mixture of price and environmental acceptance. It seems to me that it is just misleading to continue to talk about whether it takes $7 or $8 or $9 to bring in our future energy supply. It is going to take a lot more than money. It is going to take a combination of governmental and private enterprise working together.

There are a couple of specific suggestions that might do as much good as throwing money to the oil industry. One is to use the Federal Government's very large need to purchase oil by the Defense Department and others. We could use our purchasing some synthetic oil, see what the oil industry would do in terms of power and take bids for say 50,000 barrels a day of shale oil or responding to potential bidding in the Defense Department. The bids should include an environmental protection plan and permit Russell Train, head of the Environmental Protection Agency, to review the bids. If we get satisfactory bidding we could go forward at whatever the lowest bid is and move into developing the shale industry or synthetic oil industry rather than simply raising the price of the existing oil and hoping that it might happen.

A second suggestion is that if we changed our leasing policy so that the Government would share in the profits, so that we had some sort of royalty bidding system where the Government got a large percentage of this higher price, then there wouldn't be quite as much concern about the prices going up. Only in America do we sell our resources in the ground at a very low price and sit back and let the price go up and let the profits simply go to the industry that is exploiting it. We should have a leasing system that gives the Government a very high percentage of these profits so that as the prices go up we don't have this problem of windfall profits.

Chairman PROXMIRE. Congressman Conable.

Representative CONABLE. Thank you, Mr. Chairman.

Gentlemen, it has been very interesting this afternoon listening to you.

Mr. Allvine, with all due respect, you characterized the witnesses this morning as asking more questions than they answered, and I have the feeling that you have done the same thing.

Mr. ALLVINE. Probably.

Representative CONABLE. I noted down three things, for instance, about which I have some questions.

You deplored our handling of these, and one of them had to do with the foreign tax credit. It seems to me quite unlikely that a foreign government would let us take a bigger tax bite out of the product of their particular baliwick, that they would in all probability compete with us for that. We also have the serious problem of——

Mr. ALLVINE. Can I answer your question?

Representative CONABLE. I haven't asked the question yet. We also have a serious problem of what we do with multinationals of other countries which, of course, are included among the oil multinationals, and it has always seemed to me this was an important part of the incentive for the way we handle our foreign tax credit, it is an important part of the incentive for exploring for oil in other parts of the world, in the Middle East.

Now, that altogether constitutes a question, I guess. I am not arguing with you about the foreign tax credit because I don't pretend to be an expert on it, but what would you substitute for the foreign tax credit were you to eliminate it? It has been suggested we go to a deduction, for instance, instead of a credit.

Mr. ALLVINE. Congressman, I don't oppose a legitimate foreign tax credit. This has been manipulated far beyond any legitimacy. What they have done, they have two prices. They have a posted tax price and they have a real price. Now if they taxed on the real price I have no problem with it because the tax rate wouldn't be too different from what they have in the United States and what we have in the foreign countries. What they do is, they developed back in the 1950's some sort of mechanism to artificially balloon the tax payment so it goes up 70, 80, 90 percent, and they apply the difference, 80 percent as opposed to 50 percent in the United States, and they swoop over and apply that artificial ballooned foreign tax credit against so you would believe——

Representative CONABLE. Is this conversion of royalty?

Mr. ALLVINE. It is the way in which the foreign tax credit has been manipulated. Would you believe that these major oil companies on their domestic efforts are paying fundamentally no tax to the U.S. Government on their earnings and all that tax is being diverted right out of our Treasury right over to the Middle East. It takes a lot of gall for those countries to do that. Legitimate foreign tax credit is one thing. All legitimacy has been swooped away from it. I think we have every right in the world to say that we are not going to let earnings on dollars invested in the United States go to the foreign treasuries, and that is in essence what we have today.

Representative CONABLE. Is what you are saying limited to the oil industry?

Mr. ALLVINE. As far as I know they are the ones that have manipulated this system to divert its purposes and it has been diverted very badly.

Representative CONABLE. That is very interesting and I am glad you have cleared that up for me.

The second issue is the depletion allowance. I have a feeling, although I may be wrong, that the companies that benefit from the depletion allowance, at least relative to their total income, are for the most part the small independents and the wildcatters and so forth, and that it was quite appropriate for ARCO to suggest we do away with the allowance for depletion because the heavy international oil companies would come in in pretty good shape and if we were to eliminate the depletion allowance it would substantially result in a decrease in competition in the industry. Am I wrong about that?

Mr. ALLVINE. Congressman, I hate to go against you again. I think the facts are to the contrary.

Representative CONABLE. Please, this is the purpose of a hearing, to try to instruct the Members of Congress present.

Mr. ALLVINE. That the independents have smaller producing wells, the higher cost wells and they have not historically been able to take full advantage of the depletion allowance. It is the large companies with the big producing wells that have historically taken the near maximum advantage of the depletion allowance.

Representative CONABLE. Aren't a great many of our small companies surviving primarily by virtue of their tax incentives rather than their power, their economic power?

Mr. ALLVINE. I think the point that we are raising is not going to be answered there. I think it needs to be looked into and my proposition would be that the depletion allowance is more advantageous to the large petroleum companies with the high producing wells and lower cost wells and less advantageous to the independent small producers and particularly the strippers. The strippers don't enjoy much of a depletion allowance.

Representative CONABLE. Well, perhaps you have straightened that out for me. I am not sure. I think there may very well be a greater economic advantage expressed numerically for the big oil industries here but I think there also is a serious question of competitive survival involving the smaller ones. I may be incorrect on that but I accept the general outlines of your statement.

What about bonus bidding, what are you going to suggest in lieu of that? You are perhaps suggesting a royalty arrangement such as——

Mr. ALLVINE. I won't go as far as Mr. Freeman.

Representative CONABLE. I want to raise questions because I can just imagine the outcry that would go up for giveaways were we not to have bidding on offshore oil. Actually, we have a deficit coming up this year of possibly $4 billion instead of $8 billion because of the revenue that has been derived from the sale of offshore oil leases and it has been a one-shot deal, to be sure, but if the public were to think that the oil companies could get something worth $4 billion to them, without having to bid on it, I am sure there would be some political repercussion involved.

Mr. ALLVINE. Well, we haven't got it yet. The money that they paid the United States, from $2.5 to $4 billion, is paid for by the citizens in terms of higher prices. Don't feel sorry for yourself from that standpoint. If we brought in oil at low cost, if we don't have

the enormous bonus bidding system, if we had a reasonable tax structure, I think it is enough to let Uncle Sam take 50 percent off the profitability of the oil earnings. I would rather have that any day over the long run than I would the money that would rise and assure the destruction be dominated over the long run by the giants in the industry.

Representative CONABLE. That is to me the dilemma about this. However, offshore oil is very expensive to develop in any event and I have serious questions whether you are going to get the small people to participate in that. We have had a very difficult time keeping together a consortium that would include some small interests with respect to the Alaska pipeline.

Mr. ALLVINE. Congressman, over the long run the only ones that can afford the big bonus bids are those companies that are going to eventually, and I say eventually, when Government gets out of price control, as it will after it gets things screwed up so badly, you are going to have one price, when you have one price, only one, that is going to afford, when the long run equilibrium to pay the high prices are the giants of industry that will get the windfall from existing crude oil, and that is the way it is going to shake out in the long run. These people that get their neck out and are getting $8, $9, $10 for new oil, wait until equilibrium sets in. They are not getting the $10 price and oil industry giants are going to take over the oil. It is not working to the benefit of the competition to have a bonus bidding system.

Representative CONABLE. Well, thank you for further clarifying those points. As you can see, I did have some questions. You are an expert on distribution. I wonder if you would instruct us a little about price elasticity. Mr. Simon's whole position seems to be based on the assumption there is appreciable price elasticity in the distribution of gasoline. Mr. Nader said that there was virtually none. Certainly, if there is virtually more, we are not going to accomplish much by increasing the cost or permitting the cost of gasoline to increase. So, what is your view as an expert on distribution?

Mr. ALLVINE. I would rather defer to someone else.

Representative CONABLE. Really; whoever wishes.

Mr. DARMSTADTER. Chances are that both Mr. Nader and Mr. Simon, in their divergent views on this matter, are, to misquote Mark Twain, exercising or indulging in a vast amount of conjecture on the basis of a small investment in facts—the point being that there is really very little hard information available about the response of users to high prices in the case of automotive fuels and electricity. There have been a number of studies and Mr. Freeman is directing some of these in connection with his energy policy project for the Ford Foundation and, hopefully, some of the work now being done will elicit more information and insight into the question of elasticity. The data going into these studies—to which the results ultimately are sensitive—are based on historic experience in which prices have fallen; there is no certainty at all that users are going to respond symmetrically to rising prices as they did when stimulated by falling prices in the past. Another deficiency arises because we have to use cross sectional data. Investigators look at State A, State

B, compare the retail prices for gasoline at the pump between those jurisdictions and look at the quantity sold and somehow contrive their assessments of predicted elasticities from this kind of tenuous statistical base.

Representative CONABLE. It seems apparent to me that you are going to have ranges in elasticity of demand depending on regional circumstances, the availability of alternative modes of transportation?

Mr. DARMSTADTER. That is right.

Representative CONABLE. And yet it must be possible to predict some sort of a generalized rule of thumb.

Mr. DARMSTADTER. To some extent the regional variations in transport modes already reflect circumstances enablying us to speculate on likely impacts. In a region like New York City—where prices tend to be higher than surrounding jurisdictions—there is already a far more pervasive utilization of public transport relative to privately owned automobiles than elsewhere, so that if prices of gasoline rise further in New York City, the chances are that you are not going to get much of an additional diversion away to other forms of transport.

My own judgment, Congressman, is that in the short run it would probably take a really large increase in the price of gasoline to curtail demand significantly. Over a period of years, as allow for the possibility of more attractive alternatives in transport and for the acquisition of more efficient automobiles, you will no doubt get a more positive downward response.

Representative CONABLE. Mr. Darmstadter, you expressed some concern we know so little about the profitability and some of the other aspects of the oil industry. Isn't this true of almost every industry in the United States, and is your concern about this based on the assumption that we will have a great deal more Government regulation and therefore it is essential that it be better informed. Generally speaking, we haven't worried much about profitability, we have instead worried about appropriate taxing of profits and have allowed competition to do the regulating, and from that have assumed that we didn't need to know a great deal about the detailed functioning of the industry, and I assume that what you are saying, when you say we need to know a great deal more about the oil industry, that you are assuming that the Government will be in fact involved to such a degree that unless its regulation is informed and wise it will be more disruptive than helpful; is that correct?

Mr. DARMSTADTER. Without dodging your question, I believe it was Mr. Freeman who was speaking about the lack of knowledge about the profitability of the industry.

Representative CONABLE. I think you all are talking about the same thing to a certain degree.

Mr. DARMSTADTER. Let me get in the following thought, which may be somewhat irrelevant, before deferring to him. I often have the feeling that we know not much more about other industries than we do about the oil industry, but somehow, the oil industry is currently having to take it on the chin a bit unfairly. We tend very often to question the validity of information from the oil industry

because it is descrbied as reflecting a voluntary or cooperative submission of information. But much information to the Government about American industries rests on voluntary furnishing of data and in formation through trade associations or companies. Of course, some census-type information is mandated as a result of legislation and here penalties are imposed if there is no compliance. Perhaps more oil industry data should fall into this category. But a blanket condemnation of voluntarily furnished data seems to me unwarranted.

Mr. FREEMAN. The short answer is, yes. We are finding out that energy is indeed the lifeblood of modern society, that it is the one shortage that we cannot tolerate, that the industry was correct when it said a country that runs on oil can't afford to run short, and that it is an industry affected with the public interest. An oil refinery is just as important to America as electric powerplants, and, as a matter of fact, electric powerplants are not going to be able to run very well if they don't have fuel to burn in them. We have had decades where the oil industry delivered the goods without question and we didn't as a nation feel we needed to know quite so much about their operation as we do now.

Representative CONABLE. If I could interrupt I think it was you who mentioned a long period of neglect. You can say the same thing, the Government for a long time neglected the Rockefeller children. Neglect is a function of need to a certain extent and, of course, we haven't had that; the Rockefeller children didn't have serious need so we haven't had serious need to develop all of these which now we suddenly are finding ourselves short of. So it isn't neglect unless you need it and perhaps we have needed it longer than we realized, but I somehow bristled a little at the characterization of neglect with respect to the development of this information largely involving higher cost production than what was so readily available and so taken for granted by us.

Mr. FREEMAN. I use the word "neglect" in the sense of lack of foresight, perhaps speaking about myself as much as anyone. I was in Government many of these years. We did try to get some of this information in the past. I don't think that the Government completely neglected the oil industry. We maintained an oil import quota for 14 years to protect them against price competition from foreign oil. We maintained the Connally Hot Oil Act to give a Federal sanction to proration and production controls in Texas and Louisiana and we maintained the depletion allowance for all these years. So neglect was not complete. We also, I might add, maintained price controls over natural gas all those years. So there were a number of governmental interventions but we never were able to get the attention of the poeple at the top to extract from the petroleum industry information on costs and some vital information that I think is highly relevant to the policy then and more relevant today.

Chariman PROXMIRE. Mr. Freeman, this morning we had a colloquy with Mr. Simon about how high the price at the gas pump is going to go. It is now averaging say 44 cents, roughly. And at one time his office did indicate that they thought it might go to 55 cents.

This morning he indicated he didn't know to how high it would go; eventually it might go higher than that.

What is your expectation about the price of gasoline given the present attitude of the Energy Office and the economic factors involved, and how high do you think it should go in order to do the job of providing additional incentive for production and so forth?

Mr. FREEMAN. I am reluctant to join ghe crowd of predicting higher and higher prices because I am a great believer in the projections being the father of the event. It seems to me that all this talk about gasoline prices at some astronomical levels permits people to overlook the fact that every penny that it goes up on the pump is a billion dollars of additional revenue coming out of the consumers' pockets and moving into the oil industries cash flow. A person in a position that I am in, based on my experience over the years, doesn't lightly begin to talk about the kind of numbers that are being bandied about. My own feeling on the basis of the costs and the cash flow needed for the industry is that we ought to be talking more in terms of rolling back the price than in terms of further increases.

Chairman PROXMIRE. With that in mind what kind of policies should the Government adopt? Mr. Allvine has taken the position, as I understand it, that we ought to get out of price controls. We only have 50 percent control now. He says it is not working, and I think we can make a strong case on the basis of what has happened to the price recently. What do you think we ought to do?

Mr. FREEMAN. It seems to me we ought to start enforcing the thrust of the Economic Stabilization Act in controlling prices. I think just because price control administrators are not terribly enthusiastic about their jobs is no reason to change the policy.

Chairman PROXMIRE. Do you think we can do that if at the same time we can combine it with export controls? We will need that, of course.

Mr. FREEMAN. It seems to me either an export control or export tax such as the Canadians have that places a tax on domestic oil in an amount of the difference between our price and the world market price. The Candians can do it, why can't we do it?

Chairman PROXMIRE. If you hold the price down you lose one of the elements in discouraging consumption, discouraging demand, do you have to have rationing?

Mr. FREEMAN. I believe we need gasoline rationing today and that is the only item that we need to ration. I don't believe the way to ration gasoline is through the price structure. The short-term elasticity is too small to make that anything other than a very mean and cruel type of rationing system for the working poor and the people in the lower income groups. I am not opposed to, in fact I would favor, a tax on gasoline to develop a mass transit system in this country. I am not opposed to Congress raising the price of gasoline through the tax laws to raise money for things that need to be done in this country. It seems to me though until we get some more facts to prove to the contrary that the cash flow of the petroleum industry, whose profits increased 50 percent in 1973 over 1972, is not at least high enough, I assume it can finance the further expansion of that industry. One must remember this is an industry that hasn't

gotten accustomed to the idea of borrowing money. The utility industries and many other industries financed most of their expansion from borrowing money. The oil industry is moving into the kind of expansion that is more nearly akin to manufacturing plants when they go into oil shale and coal gasification.

Chairman PROXMIRE. Do it entirely through cash flow, plowing back their profits?

Mr. FREEMAN. Essentially, I don't have the facts before me but compared to the natural gas pipeline and electric power industry they have a very, very high portion of equity and very little borrowing. Rather than the consumers of this country financing the oil industry, they are going to have to borrow more money than they have in the past. I think these issues need to be further debated and explored.

Representative CONABLE. Would the consumers pay for that too?

Mr. FREEMAN. Not directly through higher prices. Of course, they will pay the interest on the bonds but I think if one looks at the financing of the electric power industry and the natural gas industry, you find that the high degree of debt in those industries has been beneficial to the consumers over the years.

Chairman PROXMIRE. Now you pointed out how little the Government knows about the energy resources owned by private industry and are woefully ignorant, the Government is, about its own resources. Could you come down with Mr. Simon on the ground with a finding there is a genuine shortage, or Mr. Nader that it is a phoney?

Mr. FREEMAN. I don't think it is phoney. It seems to me we are at the end of an era. One of the most distressing elements is the uncertainty about the situation that leaves the average consumer with the feeling that it is phoney. I can sympathize with and understand how the average consumer who is given green stamps a couple of years ago to buy gasoline and now sees the price at the pump jumping is very, very skeptical. I happen to believe that we have been in a period over several years where the demand for energy has been just galloping and additional increments of supply have been a trickle. We are moving out of the era of abundance into an era of scarcity. The problem is much more fundamental, much more serious than the questions about oil industry profits. We have, I think, a time in our history when we need to fashion a new growth policy for the country.

Chairman PROXMIRE. It is true since 1970 we have had a decline in production?

Mr. FREEMAN. In domestic production.

Chairman PROXMIRE. It is true since 1970 we have had a continuous increase in consumption, it is true we have had greater and greater and greater reliance on imports, it is true we have the embargo coming from the area where you have two-thirds of the world's reserves. Under those circumstances it seems to me inevitable that there is a shortage of a kind. I think Mr. Nader is right in pointing out we have a great waste in this country and that there are all kinds of ways it ought to be met and the fact is under pres-

ent circumstances it seems to me there is a shortage. Would you other gentlemen disagree with that or agree?

Mr. DARMSTADTER. Mr. Chairman, I believe very strongly that we have a genuine shortage in this country. I don't think it is a contrived one. Which is not to say that the existence of a shortage may not lead companies and industry from trying to exploit the shortage for short-run benefits and profitability. I am not saying they are doing this. But one must distinguish between the question of whether the shortage was artifically induced—willfully, conspiratorially induced, as is sometime alleged, I think, by Mr. Nader amongst others—or whether there are rational explanations for it. I submit the latter, though I grant you that the reasons accounting for the dilemma in which we find ourselves are complex and not tidy.

Chairman PROXMIRE. You would simply conclude that there is definitely a genuine economic shortage and you accept those facts.

Mr. FREEMAN. Yes.

Chairman PROXMIRE. However arrived at?

Mr. FREEMAN. Yes.

Chairman PROXMIRE. Mr. Allvine.

Mr. ALLVINE. I don't see how there is any way to know unless we have the facts and data supporting it. If we can believe what the Government says, there we are now short two and——

Chairman PROXMIRE. That is our dilemma. I am asking you as experts, somebody who has written a book in the area and knows, what your best judgment is. Do you think we have a genuine shortage on the basis of the meager information all of us have, or do you conclude that it is probably contrived?

Mr. ALLVINE. Well, that is two different things. How we got into it, where we are today, Senator——

Chairman PROXMIRE. I phrased that improperly. What I meant to say, genuine shortage, or is it something that people talk about. Mr. Nader said this morning if the Government announced there is a shortage of straws, that there would be a shortage of straws, people would go out and buy them and hoard them and you would have a shortage. And he implied that that is the nature of this shortage.

Mr. ALLVINE. Senator, I came to Washington this morning feeling that there is a shortage, believing the information presented by our energy Czar that we are 2½ to 3 million barrels a day or somewhere 12 or 15 percent short of what we need. If Mr. Nader is correct, world production of crude oil is up and has been in recent months, in the last month or so and continues 8 percent over a year ago, then I would have serious reservation whether or not something is not happening that doesn't meet the eye. If we are only 2 percent short in the free world there is a lot of it ending up in the United States where we seem to be today. He raised a red herring this morning and I would like to check into his sources and see whether or not that is true.

Chairman PROXMIRE. The nature of the shortage is we are embargoed and if we want to pay an immense price I suppose we can overcome the shortage. Is that your conclusion?

Mr. ALLVINE. That would be my conclusion.

Chairman PROXMIRE. There is sufficient world production to meet world demand.

Mr. FREEMAN. I happen to have read the same article, it was 8 percent for the entire year, and as I recall the article is suggested——

Chairman PROXMIRE. What article was this?

Mr. FREEMAN. I have forgotten. I read something this morning that said world production is 8 percent in 1973 over 1972. The point they made is it would have been higher than that if it weren't for the curtailment.

Chairman PROXMIRE. That was specified by Mr. Nader. He said it would have been 10 percent otherwise.

Mr. FREEMAN. I don't see that particular statement would change the basis of your opinion about whether there is a shortage or not.

Mr. ALLVINE. I misunderstood Mr. Nader. I thought he said currently. If it is not current then I still stand, we have a shortage of significant magnitude.

Chairman PROXMIRE. How can we know whether we have a shortage if we don't know the amount of proven reserves in light of new technology and——

Mr. FREEMAN. The issue is production, not proven reserves. I think that we all understand in Saudi Arabia there are hundreds of billions of barrels of proven reserves. The question is how much are they producing? And they say that they cut back several million barrels a day and everyone that I speak to that has any personal knowledge swears to me that is true, so I have to believe it.

Chairman PROXMIRE. How do we know if we don't know what the production is, we haven't gotten that, except this article that you can't identify that Mr. Nader referred to. You gentlemen are familiar with it.

Mr. FREEMAN. I don't have the benefit of the CIA at my disposal but I gather that there are ways of checking.

Mr. DARMSTADTER. It turns on the integrity of the kind of data we have on trade.

Chairman PROXMIRE. That is our dilemma. Mr. Simon himself admitted over and over again, he has done it consistently, that the data we have is very unsatisfacory, inadequate, you can't count on it. And, as you say, whether or not there is a shortage depends upon the integrity of data, whether we can believe it.

Mr. DARMSTADTER. I have enough faith in the integrity of the data to permit the general observation that there is a shortage. Unfortunately, some users, some critics of the industry, and some of skeptics of governmental pronouncements, would like to use unexplained aberrations and transitory movements in these statistical series as basis for an indictment. We should note that this is really the first time, Mr. Chairman, in which we find ourselves having to rely on weekly—not seasonally adjusted quarterly, not monthly, but unadjusted weekly figures—statistics on oil imports, production and inventory change in order to evaluate major national policy issues. The data were never designed to permit that kind of fine tuned utilization. Data were designed to permit broad guaged interpretation of what was happening.

Chairman PROXMIRE. The data we have.

Mr. DARMSTADTER. In the past no one has ever inveighed against the integrity of those statistics because they were being used for the purpose for which they were intended. We are trying to put them to a use they were not intended to be used for.

Chairman PROXMIRE. Let me ask Mr. Freeman. In view of the fact we are putting them to a new use, we want to know what the situation is, do you feel we can rely on the present system of gathering the data? After all the poeple who issue it have a clear conflict of interest. They have an interest in giving us the feel there is a shortage and they have had enormous success. In December they had a cost-price increase permitted, another price increase coming down the pike in March that will enrich them, even more fabulous profits, they are going to make. Should we rely on them telling us what the data is or should we have government derived statistics secured by the Governernment independently and objectively the way we do in agriculture, the way we do in banking and other areas.

Mr. FREEMAN. There is no question that the latter is the only alternative. The very fact we are having this colloquy and that the question is raised proves the fact that we need a system that has credibility.

Chairman PROXMIRE. Were you satisfied, did you hear Mr. Simon's testimony this morning?

Mr. FREEMAN. No, I didn't. I wasn't in the audience this morning.

Chairman PROXMIRE. Were you gentlemen satisfied, Mr. Allvine and Mr. Darmstadter, were you satisfied with, I think both of you heard part of his testimony.

Mr. DARMSTADTER. I did not hear it.

Mr. ALLVINE. I did. I thought the data he was suggesting be sought would be useful and go a long way to answering many questions.

Chairman PROXMIRE. He seems to be making a very substantial effort in that effort. He didn't satisfy Mr. Nader. You feel it would be adequate if he gets all of that?

Mr. ALLVINE. Plus the information I said about return on investment for different functional activities.

Chairman PROXMIRE. I would like to ask Mr. Freeman and Mr. Darmstadter for the record if you would take a look at this, and you can see it when you review your remarks, the assurance that Mr. Simon gave us and tell us whether you think that is adequate to get accurate information.

[The following information was subsequently supplied for the record:]

RESPONSE OF JOEL DARMSTADTER TO CHAIRMAN PROXMIRE'S REQUEST TO COMMENT UPON HON. WILLIAM E. SIMON'S TESTIMONY BEFORE THE SUBCOMMITTEE

The following brief remarks respond to Senator Proxmire's request that the witnesses read, and comment upon, Mr. Simon's testimony before the Subcommittee:

1. Mr. Simon states: "A comprehensive domestic and international data system is clearly needed and the FEO is now analyzing the best ways to structure and implement such a system. Such a system is of little use now in this time of petroleum shortage . . . there has never been in existence an adequate

energy data system. One was never needed or even desired until recently." It may today seem gratuitous to ask why, in the face of recurrent Arab threats to use oil as a political weapon and in the face of an awareness—over a period of years—that domestic producibility was peaking, an adequate informational system was not being constructed. What, if not this type of undertaking, was the purpose of the Office of Emergency Preparedness or of other groups within the Executive Branch? Better contingency planning, served by a systematic data base, represents a minimal safeguard for future developments. Periodic updating and modifcations (as new events dictate) of such a system is called for. Domestic and—conceivably—foreign economic impact analysis might also be appropriate. The desirability of extending such an emergency planning framework to other potentially critical resources besides energy should also be considered.

2. Mr. Simon should be commended for the proposed improvements in data collection and analysis, particularly as regards (a) the integrated mandatory reporting system for petroleum products; (b) the reconciliation of Bureau of Mines monthly data with API weekly reports; (c) inventory change; (d) seasonality; and (e) regional coverage.

3. Mr. Simon alludes to future plans which would, among other things, embrace the assembling of energy reserve estimates. No doubt such an effort would draw upon the specialized geological and other capabilities of what today extends across a number of governmental agencies. This objective—far more basic than merely an administrative reform—might provide the opportunity to fill a long-existing gap in the conceptual underpinnings of reserve-resource estimation, both with respect to petroleum alone and with respect to the intercomparability of multiple energy sources. Problems of reserve-resource base concepts and measurements are discussed in two Resources for the Future staff reports:

(i) *U.S. Energy Policies: An Agenda for Research* (Baltimore: Johns Hopkins University Press, 1968); see, for example, pp. 50–51 and 132–35.

(ii) *Energy Research Needs*, A Report to the Nationals Science Foundation, prepared jointly with the MIT Environmental Laboratory (Washington: U.S. Government Printing Office, 1972); see especially Chapters II and X.

4. Mr. Simon's testimony did not touch upon the FEO's current practices in reporting the oil situation to the public. I feel that these releases could do a more skillful job of relating (ex-ante) projected oil demand with realized (ex-post) consumption, the latter being necessarily constrained by available supply. Failure to distinguish between these two estimates leads to public confusion over the basis for predicting anticipated shortfalls and, after the fact, can lead people to doubt their very existence—an unfortuante consequence of a well-intentioned effort.

Mr. FREEMAN. I don't know whether he has in his game plan the program for the Government to find out what it owns. The first on his list perhaps should be for the Federal Government to get data about its own resources so that we——

Chairman PROXMIRE. He agreed to that. He agreed on that.

Representative CONABLE. Do you favor the opening of Elk Hills, for instance?

Chairman PROXMIRE. Opening of Elk Hills.

Representative CONABLE. This has been controversial lately. We had a naval officer apparently resign over it, or something of the sort, and there has been a great deal of news about this particular naval officer, and I dare say it relates to his concern that that is no longer going to be a permanent naval reserve of splendid dimension.

Mr. FREEMAN. My opinion would be that we should spend the money that is needed to upgrade Elk Hills and increase the productive capacity, I would produce it at least until the Alaska pipeline comes on stream. I would do a whole lot more than that. I think we ought to enlarge the petroleum reserve. That is the more important point.

Chairman PROXMIRE. Do you believe in view of the depletion allowance, in view of the intangible drilling benefit which the oil industry has, and in view of the 14-point western hemisphere and the golden gimmick foreign tax credit, in view of that, does the oil industry need further incentive for production at an additional price?

Mr. FREEMAN. No, sir; specially in light of the price increases they have received.

Chairman PROXMIRE. When you put all of these together they are mighty potent incentives for exploration and producing, is it not?

Mr. FREEMAN. Yes, sir; it is the thrust of my personal testimony that prices ought to be rolled back.

Chairman PROXMIRE. Gentlemen, thank you very, very much. You have been most helpful. This has been an excellent panel. I deeply appreciate it.

The subcommittee will stand in recess until next week, Monday, January 21, when we meet in S–407, the Joint Committee on Atomic Energy hearing room, to hear Deputy Assistant Secretary of the Interior, John Rigg; Chief Statistician of the Office of Management and Budget, Julius Shiskin; and John Hodges of the American Petroleum Institute. I should say Julius Shiskin is the Commissioner of the Bureau of Labor Statistics.

[Whereupon, at 4 p.m., the subcommittee recessed, to reconvene at 10 a.m., Monday, January 21, 1974.]

ENERGY STATISTICS

MONDAY, JANUARY 21, 1974

CONGRESS OF THE UNITED STATES,
SUBCOMMITTEE ON PRIORITIES AND
ECONOMY IN GOVERNMENT OF THE
JOINT ECONOMIC COMMITTEE,
Washington, D.C.

The subcommittee met, pursuant to recess, at 10:05 a.m., in room S-407, the Capitol, Hon. William Proxmire (chairman of the subcommittee) presiding.

Present: Senator Proxmire and Representative Conable.

Also present: John R. Stark, executive director, William A. Cox, Richard F. Kaufman, and Courtenay M. Slater, professional staff members; Michael J. Runde, administrative assistant; Leslie J. Bander, minority economist; George D. Krumbhaar, Jr., minority counsel; and Walter B. Laessig, minority counsel.

OPENING STATEMENT OF CHAIRMAN PROXMIRE

Chairman PROXMIRE. The subcommittee will come to order. This is the second day of hearings we are holding on the adequacy, limitations, and integrity of the Government statistics affecting the energy shortage.

From the evidence we have so far, the statistical information this Government has on which to base public policy is a disgrace.

The country is asking: "Is there a real energy shortage?" And while many of us believe there is, there is yet no way to prove it beyond a reasonable doubt.

For the most part we rely on the oil and gas industry for what figures we have. But even if these figures are reasonably accurate, there are great gaps in our information—reserves, pipline flows, inventories, refinery, and amounts in the hands of industry, dealers, et cetera.

I might note that just this morning in the prepared statement submitted to us Mr. Rigg affirms that position by saying that the information we have is grossly inadequate.

The American people have been asked to make great sacrifices. This they are willing to do.

But on top of that they are being asked to pay very high prices for their gas and fuel oil. Gas prices have already gone up by at least 8 cents at the pump. Mr. Simon tells us they probably will go up another 10 cents, and Mr. Simon tells us they will probably go

up maybe 15 or 20 cents or more and no one knows, and Mr. Simon told this subcommittee he had no plans to restrict any price increase although, of course, he would be hopeful it would not go above 70 cents. This is justified on the ground that price increases are needed as an incentive to bring forth more fuel.

Since refinery capacity is limited and will continue to be limited for some considerable period of time, that argument may not be true, or only partly true.

But the true test of what price we should pay—or the consumers should pay—is what is the cost of the fuel and what is a big enough return to those who produce it, to encourage further production, refine it, and distribute it.

So far as I can determine, unlike the rest of American industry in oil, we have absolutely no reasonable cost figures on which the price increases have been based.

Further, I can find no one in the administration who appears to be interested in getting that information. While Mr. Simon was very good in his testimony to this committee on the need for factual information on production, reserves and distribution, he was very, very soft on price and cost figures.

Today we continue our hearings to see if we can plumb both the gaps in our information and the answer to these questions.

Our first witness is my colleague Senator Gaylord Nelson from Wisconsin who has concerned himself for a very long time with the issue of the adequacy of the official figures.

Next we will hear from a panel of three experts.

Mr. Julius Shiskin is the Commissioner of the Bureau of Labor Statistics and has jurisdiction over the price and employment indexes. Previously he was at the Office of Management and Budget with general supervison over the statistical programs of the entire government. From that background he will be able to provide us with numerous insights into our problems and the answers.

Mr. John B. Rigg, Deputy Assistant Secretary for Minerals in the Department of Interior has jurisdiction over the most important energy bureaus in the Government—the Bureau of Mines, the Geological Survey, the Office of Oil and Gas, and the Office of Coal Research.

Mr. John Hodges of the American Petroleum Institute is here today to tell us about the statistical information which the API provides, its strengths and weaknesses, and whatever answers and rejoinders he would like to make to whatever charges or criticisms have been aimed at the industry.

Senator Nelson, please proceed.

STATEMENT OF HON. GAYLORD NELSON, A U.S. SENATOR FROM THE STATE OF WISCONSIN, ACCOMPANIED BY RAYMOND D. WATTS, COUNSEL, SELECT COMMITTEE ON SMALL BUSINESS

Senator NELSON. I have a statement that is 8 or 9 minutes long. It may be more economical to read it than to extemporize from it.

Mr. Chairman, the subject of these hearings, energy statistics, has suddenly emerged as one of the most important—and emotional—

topics of the country. Suddenly everyone has become aware that energy statistics are not just dry numbers in big books; they are an essential element in the world's power and wealth arrangements, a factor in every human's quality of life.

Energy is the lifeblood of a modern, technological society. Its availability is, quite simply, a matter of survival. Is there any conceivable reason why the information about this critical resource should be the private preserve of a handful of powerful oil companies? The degrees of possession and use of energy separate the world's powerful from the powerless, the rich from the poor.

That is scarcely a new perception, although we are all feeling it more now. What is a new perception, for many, is that the possession or nonpossession of knowledge about energy—of energy statistics—also separates the powerful from the powerless, the rich from the poor.

It is incredible—but true—that in a society premised on freedom and equality we have permitted public energy statistics to become so bad and have allowed many vital energy statistics to become the monopolized property of a privileged few.

It is incredible—but true—that today's energy crunch finds much of the public disbelieving its reality and demanding of the Government, "Show me!", and finds the Government not having the means to "show" the public to its satisfaction.

Seven months ago, I introduced the Mineral Fuels Reserves Disclosure Act as a proposed amendment to the Alaskan pipeline bill.

Senator Proxmire and a number of other Senators cosponsored the amendment. Its purpose was to end one main part of the unbelievable state of affairs then and now existing; namely this: Our public data on mineral fuel reserves come almost entirely from unverified private sources, sources whose interests are often opposite to the public interest.

That amendment was withdrawn with assurances by Chairman Jackson of the Interior Committee that the Interior Committee would conduct hearings on the proposal when Congress convened early in 1974. Senator Jackson and I have cooperated in rewriting and greatly expanding the Mineral Fuels Reserves Disclosure Act. It is now the Energy Information Act, S. 2782, which I introduced on December 6, with Senator Jackson as the first of a present total of 14 cosponsors including Senator Proxmire.

This bill is designed to provide a means for ending the present mess our energy statistics are in. That is an essential step toward ending the mess our present total energy situation is in.

There are two things that are most wrong with energy statistics today.

First, there are too many of them in too many different places and in a form that makes much of the information unuseable. They are too complex, too voluminous, and too contradictory.

Second, in many vital respects they are incomplete.

Let me first discuss the problem of volume and complexity, and then the problem of insufficiency, incompleteness.

The General Accounting Office has identified 64 different offices within the various departments and agencies of the Federal Govern-

ment that are dealing with energy in one way or another and therefore collecting and generating energy statistics. There are, in addition, innumerable private statistical sources and services and agencies, and still other energy statistics sources in the State and foreign governments.

As a result, we have things like this occurring:

A Federal Trade Commission staff official says that the numbers being reported to and by the Federal Power Commission about natural gas reserves are in some cases as much as 1,000 percent low—that some companies' actual reserves are 10 times greater than their reported reserves.

During a single month last fall, the White House estimate of U.S. dependency on Arab oil changed from 1.2 million barrels a day on October 12 to 1.6 million barrels on October 20 to 2.0 million on October 24 to 2.5 million on October 30. In November, the Defense Department changed the estimate to 3.0 million barrels per day.

The Bureau of the Census, in its quinquennial Census of Mineral Industries, has to explain—or, more accurately, note without really explaining—the fact that its numbers provide different answers to the same questions than the numbers published for the same year by the Bureau of Mines.

In this kind of a statistical world, even the most dedicated and expert policymakers need help that is not now available to make sense out of these mountains and jungles of numbers. So the first purpose of the Energy Information Act is to provide that help. I shall explain how in a minute, but let me first describe the other problem.

The second thing that I mentioned is wrong with energy statistics is that they are incomplete in vital respects. That deficiency is due, first and foremost, to corporate secrecy and to a government policy that condones and protects corporate secrecy.

The incompleteness is also due to another Federal policy—a policy of not having the Government find out for itself what it owns in the way of energy resources.

It is simply astounding that, in the middle of an alleged energy crisis, we do not really know what our energy resources are, because the Government has not taken inventory of the fuel reserves and other energy resources in the public lands, and because it permits the reserves in private ownership to be, to substantial extent, secret.

The Energy Information Act deals with both these major problems by establishing a National Energy Information System. The job of that System will be to pull together in a systematic way the information that we have and to ferret out in a systematic way the information that obsolete policies and practices have kept us from having.

The bill sets up the National Energy Information System within a new Bureau of Energy Information in the Department of Commerce. When hearings on the bill start next month, on February 5, one of many issues up for discussion will be whether Commerce is the best place in the Federal Government to put the System. That is where it is placed in the current draft legislation, but there are many arguments for possible other locations.

The System will have three main jobs:

First, to make contact with all the existing main collectors and disseminators of energy information, public and private, and establish a computerized capability for pulling all that information together for comparison and analysis.

Second, to collect systematically from major energy companies information on their properties and operations, in sworn, mandatory reports.

Third, to divide all this information into three categories for three uses: Public, confidential, and secret.

The reason for that classification of information into three categories is to strike a reasonable balance, to draw a fair boundary line, between two essentially conflicting interests. One is the energy corporation's interest in keeping secret as much as it can of the energy information it has developed at its own expense in hopes of using it to make a profit. The other is the public's interest in having as much of that same information as possible come out in the open, so that the forces of competition or regulation or both can keep those profits within reasonable bounds.

The bill draws this boundary line at a point much more in the public's favor than do existing Federal laws, regulations and policies. We can naturally expect the corporations to contest that redrawing of boundaries as vigorously as they can, and one of the purposes of the forthcoming hearings in the Interior Committee will be to give that difficult problem a full airing.

It is absolutely vital that the Government know how much energy we have and it is the purpose of this legislation to provide the authority and means to get it.

Something that Mark Twain once wrote catches, I think, the mood of the American people today. In volume I of his autobiography, the sage of the Mississippi wrote:

> Figures often can beguile, particularly when I have the arranging of them myself. The remark attributed to Disraeli would apply—"There are three kinds of lies—lies, damned lies, and statistics."

Mr. Chairman, we cannot have the American people thinking of our energy statistics as the third and lowest form of lie. The Energy Information Act is intended to establish a national System for providing energy statistics that will be current, complete, analytic, comparable, and above all, believable.

Mr. Chairman, I have two editorials on this issue from the New York Times and the Washington Star-News which I would submit as part of this statement, if the committee wishes to include them in the record, and I have a copy of statements that were made at the time we introduced the bill by Senator Jackson and myself, which may be of some value to the record. I also have a monograph by Ray Watts, who is here with me at the table, of the Select Committee on Small Business, in which he has compiled a number of quotations on the benefits, the costs and the specifics of corporate information disclosure from 1776 to 1973, which I will submit for the committee files or for the record, if the committee believes that they are a valuable part of this hearing record.

Thank you, Mr. Chairman.

Chairman PROXMIRE. Thank you.

We would be delighted to have all that information.

The editorials will be printed in the record at this point and the rest of the material we will look over and include as much as we can.

[The information follows:]

[Editorial from the New York Times, Jan. 17, 1974]

KNOWLEDGE AND POWER

The credibility gap created by the energy crisis is threatening to match that of Watergate. The paucity of verified facts has provoked angry complaints from Congress and state governments and led to widespread public suspicion that the oil shortage may be "contrived" rather than "real," in the words of New York State's Attorney General.

In response to this pressure, which has been mounting for many weeks, major oil companies now have abandoned some of their secrecy and published statistics on their petroleum stocks. And the Administration's Federal Energy Office (F.E.O.) has departed from its willing dependence on unverified industry data to order a field unit of refinery prices, profits and supplies. These moves are in the right direction. But they do not go far enough. Nor does the information authority requested by the Administration in the emergency energy bill now before Congress, as Federal energy chief William Simon has implicitly acknowledged. He told a Senate subcommittee this week that he would soon propose new legislation providing "mandatory reporting systems and mechanisms to check and enforce their proper operation."

In the pending emergency bill, the Administration inexplicably did not ask a mandate for systematic verification of company reports by the Government, to be conducted regularly on a thorough-going basis. A study by the General Accounting Office concludes that such verification is essential to "credibility of the data on which policy decisions are based."

But leaving such veritication solely to the F.E.O. is not sufficient, for the Government undoubtedly will respect the confidentiality of company data. In what has often been a highly competitive industry, an argument can be made for the right of oil companies to insist on confidentiality. But there is little competition in times of shortage. If public confidence is to be built, an independent review of company and Administration records is vital. It could be carried out by the Congress—perhaps through a joint energy committee—or on behalf of Congress by the G.A.O.

Unlike electric power plants, oil is an energy industry "that is almost totally unregulated, Chairman Jackson of the Senate Interior Committee recently noted, adding that the international oil companies, among other things, deal with foreign governments "almost as their own State Department".

The suspicions that this situation has created at present makes it essential either that the public be informed directly or that a Congressionally-responsible body, such as the G.A.O., verify the facts for the country on a regular basis.

[Editorial from the Washington Star-News, Jan. 17, 1974]

GETTING THE ENERGY FACTS

By far the most frustrating aspect of the energy crisis is that nobody knows enough to take its measurement. The government's information about oil supply comes mainly from the petroleum industry, and projections have gone up and down like a roller-coaster during the past year. One day the fuel outlook is horrific, the next day things seem to look much brighter, then the next week brings scary prophecies again. No wonder the public takes a cynical view of the whole affair.

Obviously, the information-gathering system, which always has been a loose and poorly coordinated effort, must be perfected if the energy dilemma is to be coped with, and if the government hopes to generate public confidence. Too many people still question the reality of a critical oil shortage, which undoubt-

edly is real in spite of the variations in estimating its size. The Federal Energy Office, under the new directorship of William E. Simon, has tried to estimate for the worst eventualities, but only time will tell whether enough margin has been left for error. Admittedly, the FEO is waiting to see if intolerable car backups develop at service stations before it decides on gasoline rationing. This is what the early aviators referred to as flying by the seat of one's pants.

Of course the big oil companies, upon which the government depends for its data, have been all too secretive about their operations. Simon now is launching the first mission to pry the essential facts from them—about their supplies, prices and profits. Using his own investigators, and agents of the Internal Revenue Service, he proposes to audit every petroleum refinery in the nation, to get a clear picture of total inventories and test the fairness of price hikes. It's a bold stroke, long overdue, but more is needed. This short-term process should be institutionalized in law and expanded for the years of energy insufficiency that lie ahead.

And that would be achieved through legislation offered by Senators Henry M. Jackson of Washington and Gaylord Nelson of Wisconsin. Their full-disclosure bill calls for creation of a federal Bureau of Energy Information, empowered to collect all needed facts from every element of the energy industry. No less important than acquiring this vast information is having such a central, separate agency to coordinate and analyze it.

Some beneficial alterations in the bill may be proposed, in hearings to be held soon, but the concept is right. For energy, as we all finally have realized, is the key element in our economic life, and shocking surprises of supply and demand must be avoided in the future. The country could be brought to great grief if a big enough shortage shock should come along.

[From the Congressional Record, Dec. 6, 1973, pp. S22002–S22014]

(By Mr. NELSON (for himself and Mr. JACKSON)

S. 2782. A bill to establish a National Energy Information System, to authorize the Department of the Interior to undertake an inventory of U.S. energy resources on public lands and elsewhere, and for other purposes. Referred to the Committee on Interior and Insular Affairs.

ENERGY INFORMATION ACT

Mr. Nelson. Mr. President, for the first time since World War II, the lights are going out all over America.

Our people are reading this morning's bad news in half-darkened restaurants.

At this moment, Americans are getting traffic tickets for driving over 50, although they have paid—dearly, if not wisely—for cars and highways designed to carry them at 70.

Here and there factories are closing and their employees are being laid off. There are many reports and more rumors of closings of plants, offices, and schools soon to come.

Rationing of gasoline, heating oil, or both seem real possibilities this winter.

Suddenly, the concept energy crisis is very personal. Suddenly, the importance of fuel in our accustomed way of life is obvious in a new, more intimate way.

Yet the crisis should not have come as a surprise to the country. There were warnings enough so that 10 years ago we should have had ready contingency short-range plans for any crisis and long-range plans to meet our continuing energy requirements. Although for over two decades a small number of individual experts have repeatedly warned about the impending energy crunch, the President, the Congress, the press, and the public paid scant if any attention to it. They probably did not notice the warnings at all. It was not current news. It was not today. And for most of those who did notice the warnings it was considered alarmist nonsense because, after all, some magic technology would solve the problem in timely fashion anyhow.

It should be specifically noted that it was the environmentalists and resource experts who understood the problem and issued the warnings. If their advice had been followed we would not now be in this critical situation.

The question now is where do we go from here? No single cause is responsible for our plight, and no simple remedy will cure our situation. Still we must pinpoint each separate mistake that has contributed to our present condition and correct it as best we can.

One major mistake in American practice and policy is quite obvious: We have failed to manage energy because we have failed to manage energy information. We are sitting in the dark because we have been making our energy policy in the dark.

The "we" in these remarks refers, generally, to the whole American people and their government; but, most specifically, to the President, the executive branch, and the Congress.

Three especially important shortcomings in our management, mismanagement, and failure to manage energy information stand out.

UNKNOWN RESOURCES

Failure No. 1 is that we have never obtained a thorough public inventory of our energy resources. The Government has never taken the trouble to determine the energy resources in the public lands of the United States, and has accepted the word of private interests about the resources in the private lands. Without Government inventories of public reserves, without Government validation of private reserves, our speculation about our long-term energy situation is just that: speculation. Surely the subject is important enough to deserve something better than guesswork.

INFORMATION EXPLOSION

Failure No. 2 is that we have not developed better methods—indeed we have developed no thorough, systematic methods at all—for the comprehension and use by the Congress and the public of the massive amounts of energy information that are available. We have not faced up to the problem of the information explosion.

GOVERNMENT AND CORPORATE SECRECY

Failure No. 3 is that we have not insisted that a great deal of other vital energy information that has not been available to us, to the Congress and the public, be made available. We have not faced up to the problem of government and corporate secrecy.

NATIONAL ENERGY INFORMATION SYSTEM

The bill we are introducing today, the Energy Information Act, is intended to avoid these mistakes in the future by dealing forthrightly with all three of these past failures.

It does so by establishing a National Energy Information System to be operated by a new agency, the Bureau of Energy Information, which will be a coequal sister agency of the Bureau of the Census. The Bureau, together with the Department of the Interior, will have all necessary powers to correct these old failures.

In function, the Bureau of Energy Information will somewhat resemble an amalgamation of the statistical and analytical roles of the Bureau of the Census, the Bureau of Mines, the Congressional Research Service, the American Petroleum Institute, the American Gas Association, and the Texas Railroad Commission; but the new Bureau will specialize in energy information of the "hard," objective, smallest-unit, statistical-base variety. The bill expressly contemplates that the Bureau will draw on the work of each of those—and many other—public and private energy information gatherers and analysers, without displacing any of them and, to the utmost extent practicably, without duplicating any of the immensely useful work they are all doing. Rather than redoing the work of others, the Bureau will be directed to tie together and relate and compare the work of others, but also to fill in certain large and vital gaps in the work of others. And it will make the results of all that work available, in a more manageable form, to those who need them.

THE ENERGY INFORMATION PYRAMID

The two problems we need to solve—the great proliferation of energy information and the great secrecy of some energy information—are so interrelated that they are most easily discussed together.

All the information in the world about our supplies and consumption of energy might be likened to a great pyramid, immense at the bottom, a tiny point at the top.

In the base level of the pyramid are all the smallest unitary, objective, quantitative facts of supply and demand. Examples on the supply side would include the proved reserves and daily production of a known oilwell, the crude oil input and refined product output of a particular, refinery, the route and cargo of a named tanker, the daily quantity and type of product moving through a specified pipeline, the kilowatt hours generated by a particular electrical plant, the contents of identified fuel storage tanks, the daily sales of a particular service station.

On the consumption side examples would include the jet fuel burned by a named airliner, the coal consumed in a particular powerplant or steel mill, the natural gas burned in Mr. X's home and Mr. Y's apartment building. Obviously, each fact has two components—one of things, the other of people. Every building-block fact in the foundation layer of our pyramid includes the name of a person, country, or company having a proprietary or controlling interest in the energy resource that is being produced, transported, converted, or consumed.

The second layer of the pyramid is smaller than the base, the third still smaller, and so on. The second and all successive layers to the top are not only supported by the bottom layer—they are the bottom layer, condensed and repeated and rerepeated at progressive stages of summary and analysis. Each upper level is only as good—that is, reliable—as the basic facts that were taken into it from the layer beneath, and the process by which those facts were selected and summarized and analyzed and presented.

VISIBLE AND INVISIBLE FACTS

While the pyramid of energy information is built—as all pyramids must be from the bottom up, it is viewed by most of us from the top down, or in little spots and patches, here and there, near the top, or near where we happen to be.

Just as in the case of the real great pyramid, in our pyramid of energy information the bottom layer, the basic layer that supports everything above it, is completely hidden from us. Most of the blocks are on the inside; but even the outside blocks of the lowest layers are covered up by the sands.

In the past, this invisibility of the foundation facts of energy information has not troubled many Americans. The blocks of the pyramid that they could see, near where they lived and worked, looked good enough, and the banner waving from the very top looked best of all. It read, "Energy Is Cheap and Abundant."

Now—it seems suddenly to most citizens, although some of us have been warning for years that it would happen—the blocks near where we live and work look dark and crumbling, and the banner at the very top has been changed. It now proclaims, in every language of the world and in letters high enough for all but the blind and illiterate to read. "There isn't Enough Energy."

These shocking changes in the appearance of the part of our energy information pyramid that we can see are making all of us—in and out of the Congress—look more closely at the whole pyramid, and start to wonder and ask about the parts we have never seen.

This new curiosity is a healthy thing. "Knowledge is power," Francis Bacon wrote in the 16th century. To increase our power to deal with the energy crisis, we need to know many things about energy that we have not troubled ourselves to know before. Furthermore, it is not enough merely to "know" some "fact"; we need to know how we know. When our source for a particular fragment of knowledge is something other than our own observation and experience, we will be wise to inquire about our source's source. There is real peril, if we omit this, that some fact we are learning about oil will prove, actually, to be snake oil.

TOURING THE PYRAMID

With these thoughts in mind, let us take a tour of the energy information pyramid and see how it is constructed.

The top layer contains just one pointed stone: The net supply-demand ratio for all kinds of energy, worldwide. Right now, as we have noted, the largest mark on that stone is a minus sign, and the flat on top reads, "There isn't enough."

That pinnacle conclusion represents the sum of conclusions for the supply-demand ratios of the various different sources of energy. We find those on the next-to-the-top layer of the pyramid. Separate stones there report the world-wide reserves, production and consumption figures for petroleum, natural gas, coal, hydroelectric power, nuclear fuels, geothermal power, and everything else combined—to name them in the order of their current importance as energy sources in the United States.

Each figurative "stone" in that next-to-the-top layer is, in reality, made up of immumerable and often conflicting official and unofficial reports. They are presented in every information-storage medium known to man: Books, pamphlets, periodicals, and electronic tapes are some of the most important.

Each conclusion for a particular energy source in that next-to-top layer, the global level, is of course made up of the sum of data and conclusions at the level of continents, the next layer down, and countries, the layer below that. To work one's way down the pyramid in an effort to understand just one of the major fuels is to develop a healthy respect for the enormous complexity of the information that is publicly available—the first problem—and a growing irritation about the information that is not publicly available—the second problem.

PETROLEUM STATISTICS

Let us make that trip, as a legislative or newspaper office staff not made up of energy experts might try to make it, for just one fuel, the most important, petroleum.

From a pamphlet called "Commodity Data Summaries" published by the Bureau of Mines, U.S. Department of the Interior, in January 1973, we can learn such facts as these: At the end of last year, the world total of crude petroleum reserves was 631.9 billion 42-gallon barrels, and world production of crude oil in 1972 was 38.1 billion barrels. The world total is broken down into eight country and area totals, as follows:

PETROLEUM, CRUDE[1]

	Production		Proved reserves
	1971	1972[2]	
World production and proved reserves:			
United States	3,454	3,462	38,100
Iran	1,662	1,800	55,500
Kuwait	1,068	1,200	66,000
Libya	1,008	808	25,000
Saudi Arabia	1,642	2,100	145,300
Venezuela	1,295	1,180	13,900
Other free world	4,408	4,700	189,900
Communist countries (except Yugoslavia)	3,098	3,250	98,200
World total	17,635	18,500	631,900

[1] Volumes in million 42-gallon barrels.
[2] Estimate.

Source: Division of Fossil Fuels, Bureau of Mines, January 1973.

Where did those country and area totals come from? Obviously, the world totals are only as good as the parts. A study of the Bureau of Mines' comprehensive annual Minerals Yearbook gives some idea of how widespread and diverse are the sources of the components from which these great aggregate numbers were derived.

Libya's annual total production, for example, is the sum of monthly totals obtained from Petroleum Press Service.

Reserves data for the United States and some foreign countries are obtained from the Committee of Petroleum Reserves of the American Petroleum Institute, a private trade association.

U.S. annual production totals are the sum of monthly totals obtained from State agencies in each of the 31 oil-producing States.

By the time all these data are pulled together into one reasonably complete and fairly well-organized—although unindexed—source, the Minerals Yearbook, they are at least 2 years old. A complementary statistical service, the Census of Mineral Industries conducted every 5 years by the Bureau of the Census of the Department of Commerce, is published on an even more delayed schedule. The 1967 census data did not become available until late in 1970. Data from the 1972 census will begin to trickle out in 1975.

As a result, if a Senator or a journalist wants to keep up with oil—to say nothing of other energy fuels—he must consult a whole host of weekly, monthly, and quarterly bulletins from such sources as the Bureau of Mines, the American Petroleum Institute, the American Gas Association, the Texas Railroad Commission—and of course the other 30 State agencies which have less comprehensive reporting programs—and the specialized press.

Even if this were done, there are some questions to which answers are not available, at all, ever—and they are not small questions. Here are some examples:

What are Gulf's proved oil and gas reserves, State by State in the United States and country by country in the world?

What are Exxon's current, separate profits derived from each of its separate, vertically integrated operations and in each principal locality: for example, what was Exxon's return on invested capital in crude petroleum production in Texas, or on gasoline retailing in Pennsylvania.

The Federal Trade Commission cites "estimates of Rice, Kerr & Co., Engineers," as its presumably best and perhaps only source of data on company shares of domestic proved reserves. The American Petroleum Institute's committee of petroleum reserves, like its counterpart committee on gas reserves in the American Gas Association, is sworn to keep secret all individual company data it obtains.

This secrecy is harmful in at least three principal ways. First, it obstructs Government validation and analysis of the basic information on which our petroleum and gas policy are founded. The Government is in something like the position a bank customer would be in if his bank gave him a monthly statement on his checking account without the canceled checks and deposit slips, provideing instead only the beginning and end-of-month balances.

Second, corporate secrecy impedes the operation of both of the two systems on which we rely to curb corporate abuses and corporate greed: The competitive system and the regulatory system. Competitors cannot compete and regulators cannot regulate without access to reasonably detailed information on the individual companies that make up the energy industries.

Third, secrecy works a grave inequity on small business. The great size, vertical integration, and diversification of the major energy companies give them a tremendous information advantage over their smaller, more specialized competitiors. The little company, if it is public, must disclose fairly intimate details in its registration statements and annual reports filed with the Securities and Exchange Commission. The major company tells far less, because so many data are consolidated in its reports.

HOW ENERGY INFORMATION ACT WILL HELP

The Energy Information Act is intended to help Congress, the rest of Government, and the public deal with the twin problems of the information explosion and corporate secrecy.

It will give one new agency, with new perspectives, authority to take a new approach to these old problems. The agency will be the Bureau of Energy Information, which will be established as a sister agency of the Bureau of the Census in the Commerce Department, coequal with both that agency and the Interior Department's Bureau of Mines. It will to an important extent rely on the ongoing work of both those older bureaus; but it will have two functions that differ from the functions of either of them.

First, it will be charged with a duty to survey on a current basis all existing major energy information sources and pull the data together for quick, computerized comparison and analysis. It will be an agency expected to be able to answer specific questions about specific current conditions, both in fine detail and in global aggregates. It will—with certain limitations I shall describe shortly—answer those questions, no matter who asks them. It will assemble in one place the computer hardware and software and the expert personnel to develop a new capability for fast question answering.

Second, in order to do those things, the Bureau will be authorized to collect and make public some corporate information that is now secret.

Let me give three examples of the kinds of requests and questions I hope and expect the Bureau of Energy Information would be able to handle, for a Member of Congress or a member of the public.

First. During the national and congressional debate on the trans-Alaska pipeline, public reports of the quantity of proved crude oil reserves on the North Slope of Alaska ranged from 10 billion barrels to 24 billion barrels. Please prepare a report or a computer printout showing all items of the estimates, and the source of each item in the estimates, that produced these widely different totals. My source for the 24-billion-barrel figure was Senator JACKSON'S proposed amendment No. 315 to the Alaskan pipeline bill, S. 1081, while the 10-billion-barrel figure came from a display ad supporting the pipeline which the Atlantic Richfield Co. ran in the July 2 Washington Post during the debate.

Second. What companies have reported what quantities of heating oil in inventory in the State of Wisconsin, and to whom and when were such reports made?

Third. The following table appeared in the November 19 Washington Post:

OIL FIRM PROFITS UP

Percentage of increase in major U.S. oil companies' net earnings according to Petroleum Intelligence Weekly:

	1973 over 1972 [1]	Average annual percent increase, 1970–73
Exxon	80.7	22.8
Texaco	48.2	13.8
Mobil	64.1	17.9
Standard of California	50.7	19.6
Gulf	90.9	10.8

[1] 3d-quarter figures.

Please furnish a report showing the quarterly and annual profits of the five companies named in this table, itemized for major geographical areas of the world and major separate lines of business, such as production, refining, transportation, wholesaling, and retailing.

In order to answer questions of this type in the kind of detail their importance deserves, the Bureau of Energy Information would have to obtain some types of data that are not now made public. The bill would give the Bureau the authority to get that information.

Reasonable competitive equities of individual companies would be protected by this bill, but the wholly unreasonable corporate secrecy that present law tolerates would be ended. The bill would establish three categories of information within the Energy Information System. The first category would be public, the second, confidential, the third secret. Each category of information would be stored in a separate library. Everyone would have access to the public library. Only Government officials needing the data for official purposes would have access to the confidential library, while the secret library would be closed to all except the limited number of personnel needed to compile the data in that library into anonymous statistics.

In general, the bill would permit other parts of Government, including the Congress, to have confidential use of much of the same type of information ob-

tained from very significant companies that now the Bureau of Mines and the Bureau of the Census can see, that is, information from particular plants, mines, and stores.

In addition, reserves data for companies, now secret even from those two Bureaus, would become available to Government officials, for official use on a confidential basis. The Bureau of Energy Information would be authorized by the bill to collect such information directly from the significant companies, or, in the interests of speed, efficiency, or economy, from associations to which companies now report it, such as the American Petroleum Institute and the American Gas Association.

Small business would suffer no new reporting burdens under this bill, because the legislation exempts from its reporting requirements companies having less than $5 million worth of mineral fuel reserves or less than $50 million in other energy assets for in annual sales in the energy industries. It is the theory of the bill that sufficient data from the smaller concerns are being obtained now. It is the major companies that now have and are permitted to keep too many secrets which impair our ability to understand and manage our energy resources and the energy crisis.

These large companies would have to disclose—as they are already doing to the Bureau of the Census, the Bureau of Mines, and their trade associations—certain data of a fairly detailed and competitively sensitive sort. However, the bill expressly provides that these detailed data would not be made available to their competitors in other than a reasonably aggregated or large-package form. Specifically, any line-of-business or profit-center information about a company could be kept out of the public domain under this bill if it were shown that the reasonable competitive equities of the company so required.

In general, the bill would permit giant corporations to keep confidential any information that pertained to a segment of the business smaller than $25 million a year in annual sales. Business segments larger than that would not have to report in any more detail than would be required in the annual reports which the segment would file with the SEC if it were an independent company.

SURVEYS BY INTERIOR DEPARTMENT

The bill would also provide, for the first time, for a regular annual inventory by the Department of the Interior of Mineral fuel reserves and other energy resources in the public lands of the United States. The Department would be authorized to use estimates where necessary, but to make onsite geological and engineering tests whenever practicable for this purpose. In addition, the Department would be authorized, when requested by the Director of Energy Information, to make onsite spot check inspections on private lands to validate information on fuel reserves and energy resources reported by private companies.

PREDECESSOR MEASURES, AND BACKGROUND

The Energy Information Act is an amplification of the Mineral Fuels Reserves Disclosure Act, which I proposed as an amendment—No. 319—to the Alaska pipeline bill, S. 1081. Title III of this new bill, pertaining to inventories and inspections by the Department of the Interior, is derived from the amendment—No. 321—to my amendment, which was offered by the Senator from Minnesota (Mr. Humphrey) and accepted by me. Those interested will find discussion and debate on those two amendments in the CONGRESSIONAL RECORD for July 16, 1973, beginning at page S 13601.

Both amendments were withdrawn upon reaching an understanding and agreement with the distinguished chairman of the Committee on Interior and Insurlar Affairs (Mr. JACKSON) that he would cooperate in the rewriting of the amendments as separate legislation and would arrange for early hearings on the legislation before that committee.

Beyond the energy crisis the basic premises of this legislation are, first, that the power of giant corporations over the quality of life has become so great that such corporations must now be regarded as if they were governments, for govern they do; second, that governments—including corporate governments—derive their just powers from the consent of the governed; third, that consent, to be meaningful, even to be real, must be informed consent; fourth, that the free exchange and availability of industrial as well as political information

are therefore the lifeblood of a free society; and fifth, that the Congress has no higher duty than to provide channels and mechanisms for the exchange and availability of information about the holders and uses of governing power.

CONCLUSION

If this Nation is going to manage and contain the energy crisis, the Congress and the public must be able to get quick, reliable answers to extremely complex questions. To achieve the necessary question-answering capacity will require a greater effort, and a somewhat greater expenditure, on information collection and processing than we have heretofore given. The Energy Information Act is offered as a vehicle for discussion of that urgent new effort. At hearings which will begin early next year, I hope that the best experts on both energy management and information management will help us refine this measure and as refined, quickly enact it into law.

Mr. President, I ask unanimous consent to insert both a digest and the text of the bill in the RECORD at this point. Following these insertions, I wish also to insert the text of an article from last Sunday's Washington Post—December 2—by Bernard D. Nossiter, captioned "North Sea Oil: More Than We Know." The article very trenchantly illustrates the type of inexcusable secrecy about mineral fuel reserves that now exists, and which the Energy Information Act would go far to correct.

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

DIGEST OF S. 2762, THE ENERGY INFORMATION ACT

Energy Information Act—States purposes to provide for improved energy information within a National Energy Information System, for inventories of energy resources in the public lands, for regular reporting of information by significant corporations in energy industries, and to provide information that will aid in improved policy making, conservation, science, environmental protection, competition and regulation. Defines terms.

Title I: Bureau of Energy Information—Establishes a Bureau of Energy Information ("the Bureau") within the Department of Commerce, headed by a Director of Energy Information ("the Director") appointed by the President by and with the advice and consent of the Senate. The Bureau is to operate, maintain and improve the National Energy Information System. The Bureau is to establish consultation, coordination and exchange arrangements with other departments and agencies of government, and private institutions, which have libraries of energy information. The Bureau is also to conduct extensive studies and reviews of the state of information on such subjects as the institutional structure of the energy supply system, energy consumption patterns, statistical and accounting methods and problems in energy information, price and cost factors affecting energy, technological and environmental factors, and capital requirements of public and private institutions responsible for energy. The Bureau is also to report monthly, quarterly and annually on specified classes of energy information.

Title II: National Energy Information System—Establishes a National Energy Information System ("the System") to be operated and maintained by the Bureau. Establishes the System in three components: a public library, a confidential library, and a secret library. Provides that the System shall use other available libraries of energy information; use modern, including microform and electronic, methods; have its information on energy industries organized by establishments, companies, Standard Industrial Classifications, geographical locations and other referents; and have capacity to receive and answer questions of fact concerning, and compare sources of energy information. Provide for unlimited public use of the public library of the System, at fees generally sufficient to cover costs of such use; but provides for waiver or reduction of fees in certain cases of public-interest use. Provides for access to the confidential library by Federal Government officials, for official use only. Establishes the secret library as repository for information that may be used only for statistical purposes in anonymous aggregates. Establishes priorities for entry of information into the System. Establishes standards for placement of energy information in the public, the confidential, or the secret library. De-

fines and limits national security and reasonable competitive equities as reasons for placement of information in the confidential or secret library. Provides for removal of information more than 25 years old from the confidential or secret library to the public library. Provides for hearings in cases of dispute on placement of information in a particular library of the System, and for placement of information in question in the secret library pending resolution of the dispute. Provides penalties for unauthorized disclosures and thefts of information from the System, and for failure to provide required information for the System. Authorizes Secretary of Commerce or the Director to obtain from an affiliate of a company, or an organization of which it is a member, any information which they are empowered by this Act to obtain directly from the company, provided the company is notified. Gives Secretary of Commerce and Director power to inspect records and subpena documents in certain cases. Confers jurisdiction on District Courts to enforce such subpenas.

Title III: Energy Resources Inventories and Inspections by the Department of the Interior.—Directs Secretary of the Interior to compile and maintain, on annual basis, an inventory of mineral fuel reserves and other natural energy resources in public lands of the U.S., including the Outer Continental Shelf. Provides that the inventories may be based on estimates, supplemented as feasible by onsite geological and engineering inspections by departmental personnel. Provides that the first inventory is to be completed within 18 months and reported to Congress within 20 months of effective date of this title. Provides that copies of all such annual reports by the Secretary of the Interior be furnished the Director for the System's public library. Provides that, on request of the Director, the Secretary of the Interior shall make onsite physical inspections of mineral fuel reserves and natural energy resources reported in private lands. Contains directions for the contents of reports by the Secretary of the Interior.

Title IV: Information on Mineral Fuel Reserves and Natural Energy Resources—Provides that substantial energy resources companies are to file verified annual reports with the Director on the mineral fuel reserves and natural energy resources they control. Contains directions on the contents of such reports. Provides for promulgation by the Director of forms for the making of such reports and also of the reports required by title V of this Act. Provides for clearance of such forms by Office of Management and Budget within seven months after the effective date of this title. Provides that such forms shall be mailed by the Director to reporting companies within 11 months of effective date of this title and be returned by companies to the Director within 60 days after receipt. Provides for single rather than dual reports by companies which are both substantial energy resources companies and major energy companies, as defined in Act (companies controlling $5 million in mineral fuel reserves, $50 million in other natural energy resources, or $50 million in sales or assets in the energy industries are, generally, within the definitions). Provides that information obtained by Director on report forms required by this title and title V shall be placed in the public, confidential, or secret library of the System, as provided elsewhere in this Act.

Title V: Information on the Energy Industries—Requires major energy companies in commerce to file verified annual reports, on an establishment basis, on their operations worldwide. Provides for the making of such reports in two parts, one being for the public library of the System and the other for the confidential or secret library. Contains directions for the contents of such reports, including information on shipments by Standard Industrial Classification, total business receipts, and in certain cases profit information. Authorizes the Director to require such reports more often than annually in certain cases, and to require from major energy companies lists describing all mandatory and voluntary reports they file elsewhere, containing energy information.

Title VI: General Accounting Office Oversight—Provides that Comptroller General of the U.S., upon his own initiative or by direction of Congress, shall review and evaluate procedures of the Bureau. Review may include issues arising under claims that certain energy information required by the Bureau under this Act is proprietary or involves the national security and therefore is entitled to be kept secret. Directs Comptroller General to report to Congress at least annually on such reviews of the Bureau; but provides that such report may be by endorsement of or addendum to the Bureau's own annual report.

Title VII: Conformance of and with other statutes—Provides that the Director may excuse a company from providing energy information required by this

Act, if the company waives confidential status of the same information as previously provided by it to the Census Bureau and protected by the Census Code [13 U.S.C 9. Amends the "Freedom of Information Act," 5 U.S.Cm 552, to provide that clauses (4) and (9) of subsection (b), pertaining to corporate and geological information, shall be construed consistently with policy of this Energy Information Act. Amends Federal Reports Act of 1942, 44 U.S.C 3504, 3506, 3508 and 3509, to make it consistent with policy and purposes of this Act.

Title VIII: Miscellaneous—Contains usual separability section and blanket authorization of appropriations. Establishes effective date as date of enactment, except titles IV and V, which are made effective on first day of third full calendar month after date of enactment.

[From the Washington Post, Dec. 2, 1973]

North Sea Oil: More Than We Know

(By Bernard D. Nossiter)

London.—Sometimes next summer, a tanker is due to take 10,000 barrels of oil from the Arygyll Field in the North Sea, 200 miles east of Edinburgh, and land the precious cargo in Aberdeen.

This will be Britain first oil delivery from the cold and forbidding waters above its contenental shelf, the start of a flow with incalculable economic and political consequences.

The government here is modestly estimating that the North Sea will yield about 2 million barrels daily a decade from now about two-thirds of what officials think Britain will then consume. This would be pleasant for Britain but of no great consequence for Western Europe as a whole.

The official line here echoes Frank McFadzean, the managing director or chief of the huge Royal Dutch Shell Co. "The realization of present hopes for the North Sea," he said recently, "will not materially change Western Europe's dependence on Outside sources .. . for the foreseeable future there is simply no alternative source (to the) Middle East."

However, interviews with oil company executives, their bankers, geologists and economists, make clear two things: The British government has persistently underestimated the oil resources of the North Sea, and deliberately turned attention away from its sizeable deposits of natural gas.

NOBODY KNOWS FOR CERTAIN

For oil alone, British officials are reliably reported to have privately doubled their figure of the sea's likely yield. In the City of London, where unromantic financiers raise the money for risky drilling ventures, this doubled estimate is doubled again.

If the money men are right and the North Sea yields 8 million barrels a day of oil, plus the equivalent of another few million barrels daily in gas, the picture changes dramatically. The continental shelf off Britain and Norway would then, in oil company jargon, become far more "interesting" for Western Europe's energy demand than the public is now officially told.

The crucial point is that nobody knows for certain. Those with the best knowledge—the big international concerns like Shell, British Petroleum, Exxon and Mobil—have strong business interests in keeping silent.

But the wide range of estimates and the rapid pace at which the government changes its own forecast—it was predicting only 1 million barrels daily not long ago—says something about government oil policy.

It suggests that crucial political and economic decisions about energy are made by officials no better equipped than a blind-folded man stumbling around a carnival funhouse.

According to informed critics, the government here has belatedly learned or acknowledged these things:

The profits of major companies could escape any taxation in the United Kingdom because they will be offset by the aritifical levies imposed in the Middle East.

Instead of the stiff exploration program the government thought it had imposed on firms, the companies are drilling at a rate of their own design, and most are behind their own schedules.

Instead of a thorough, independent examination of the companies' exploring experience, the government has relied on a handful of geologists of limited standing. As late as 1972, the agency concerned employed only nine technicians for offshore petroleum licensing.

A leading economist who served as a key adviser to the Department of Trade and Industry, the ministry in charge of energy problems, says:

"I can tell you from my experience that the government does not even know such elementary things as the current stocks of refined products."

DIFFICULTIES OF DRILLING

Oil company executives and their geologists retort that there is nothing very remarkable about changing and increasing estimates for North Sea oil. To find oil and gas anywhere, they stress, is a risky, costly, uncertain affair.

"You simply don't know what you have until that drill bites in and hits it," says a geologist who once supervised several hundred others geologists in one leading concern.

The North Sea, it is argued, is a particularly chancy and expensive place to look for oil and gas. The deposits lie deep below the surface, as much as 600 feet down. Working conditions are the worst that offshore oil men have encountered anywhere. Stiff gales blow up to 28 knots, and the icy waters and towering waves are far more hazardous than the gentle waves in, say, the Gulf of Mexico.

Optimists' estimates of what the North Sea contains, industry men argue, are based on guesses about areas that have not even been drilled. The chilling waters off Norway above the 62d parallel, the shelf west of the Shetland and Orkney Islands and north of Scotland, the Celtic Sea between Ireland and southern England.

A former civil servant who played a leading role in shaping Britain's North Sea energy policies and is now a consultant to an oil equipment firms says:

"Responsible government must be cautious. Its estimates are necessarily based on the known, not on guesses about the unknown."

An oil financier contend that there are good legal and business reasons for understating finds. "Your Securities and Exchange Commission," he says, "takes a dim view of companies that exaggerate their discoveries and thus promote their shares. Moreover, these firms are still bargaining with governments over the terms of licenses to explore and produce in the North Sea. Some of the richest finds have been along the median line, dividing Britain's shelf from Norway. If the companies disclosed their private estimates, the difficult Norwegian government might fix even harsher terms for the blocks that have not yet been awarded."

"FRONTIERS OF TECHNOLOGY"

The industry scoffs at the suggestion that it has not conducted an all-out search, at least for oil. The hunt, however, is expensive, it says. An exploration well costs $2.5 million to $5 million in the difficult waters. Once oil is found, the capital or investment cost of lifting it out is put at $2,500 for each daily barrel the field will yield, 10 or 15 times as much as on shore.

Above all, the industry complains that it lacks the big and expensive rigs needed to extract the oil as well as the skilled manpower to operate them.

"You are at the frontiers of engineering technology in the North Sea," one executive says. "We are building structures for conditions we have never met before."

Finally, the Department of Trade and Industry is blamed in part for holding up the search and production. The companies acknowledge that the government gave them liberal terms—they can hold on to their North Sea blocks for 46 years and must pay in royalties only 12.5 per cent of the price of oil they find. But the ministry deliberately steers licenses to companies that buy British equipment, and the equipment makers performance here is universally condemned. They are blamed for an unwillingness to design new rigs, failing to meet specifications, delays because of strikes and every other failure of British industry.

The buy-British policy has pushed back oil company schedules as much as 19 months, industry men say.

"We have gone as fast as we can," an expert from one big company contends. "There have been, of course, honest differences of opinion over what the North Sea contains."

Industry men delight in telling how Shell's persistent interest pushed a reluctant and rival Britsh Petroleum into exploring its Forties Field off northern Scotland. A very conservative estimate in London's financial circles now calculates that this field alone will yield from $150 million to $250 million annually in profits after taxes by the end of the 1970s.

THE CRITICS' CASE

Despite this imposing array of oil company and civil servant arguments, there are prominent critics who are unimpressed. They insist that the big companies have deliberately held back on exploiting resources in Europe's backyard and that successive governments have knowlingly or ignorantly abetted them.

One leading skeptic is Peter Odell, an economist who worked for Shell and now directs an institute of economic geography at Erasmus University in Rotterdam.

"Presentations of the scale of Western Europe's oil and gas resources and their production potential are unrealistic," he says, "either through ignorance or deliberate distortion on the part of the vested interests. The ignorance stems from the failure of governments to place necessary obligations on the companies to reveal a comprehensive set of publishable facts on their activities and then to make sure they have adequate numers of staff competent to collate and evaluate the flow of information and so to give valid advice on which to base policy decisions . . . The distorting or withholding of information appears to be the North Sea norm."

Odell points to a study made of 128 oil pools in Alberta, Canada. It shows that estimates of proven reserves increased 880 per cent between the first and 20th year after discovery.

He complains that the major oil companies have underplayed and underexplored the North Sea in order to take as much as possible from the Middle East while the taking is good. In what now may be an exaggerated time span, Odell calls this the companies' "last decade of opportunity" in the Arab world.

Thomas Balogh, the Oxford economist who was personal advier to Harold Wilson in Britain's last Labor government and first to disclose the big firms' tax-free bonanza, says much the same thing. He recently told his fellow peers in the House of Lords:

"With their hold on Arab oil steadily weakening, the oil companies, the International giants, planning in the long run, must know that the best way would be to exploit as much as they are allowed of Arab oil and keep as much British oil in reserve as possible."

GAS DOESN'T PAY

Such charges, of course, cannot apply to the independent companies who lack oil holdings elsewhere. The giants like Shell, British Petroleum, Exxon and the others who have the largest share of North Sea blocks, dismiss Odell and Balogh as wild-eyed socialists.

However, some candid company executives concede at least part of the charge, that they are turning their backs on gas. The first North Sea discoveries were gas deposits, but the search for this fuel by the majors abruptly halted when oil was found in 1970.

The companies blame their lack of interest on the diminished prospect of profits from gas. In Britain, they must sell all they find to a single buyer, the government's British Gas Corp. The companies say this puts them at a bargainint disadvantage and that the Gas Corp. has exploited it by offering low prices.

If the companies went after gas vigrously—and they are certain to find some along with the new oil fields they discover—Odell contends that Europe's energy picture could alter sharply.

The standard estimate for 1980, he observes, puts North Sea and other local gas at only 10 percent of Europe's energy demand. He calculates, however,

that indigenous gas could fill 22 per cent of Europe's fuel requirement, and thus considerably reduce the role of oil. He thinks it is reasonable to expect that the North Sea will be yielding 6 million barrels daily at the end of the decade.

If he is right, the basin's gas and oil would provide nearly half of Western Europe's energy. Instead of the conventional estimate that forecasts Europe must import oil to meet nearly two-thirds of its 1980 energy demand, Odell slashes this figure to 33 per cent.

Industry men concede that North Sea gas reserves are likely to turn out well above current estimates, although much smaller than Odell's figure. His forecast for oil, however, is in line with predictions made by some oil men unattached to the major firms.

If Odell is anywhere near the target, Europe's dependence on the Middle East would be reduced drastically.

The lack of official candor about the North Sea is strikingly illustrated by the fuss that Balogh kicked up over taxes.

Parliament's legislative oversight of ministerial agencies is shallow and uninformed compared to the searching spotlight a congressional committee sometimes shines on the executive branch in Washington. But, largely prodded by Balogh and Harold Lever, a knowledgeable Labor MP, a parliamentary committee did take a close look early this year at how much the British treasury would get from the North Sea.

At first, Department of Trade and Industry witnesses asserted that British taxes would cream off half of any company's profits from a large field in full production. Under close questioning, the civil servants conceded that these calculations did not apply to the majors.

The biggest firms enjoy what Sen. Paul Doublas once called a "golden gimmick," far bigger than the much better known depletion allowance. The majors call the bulk of the royalties they pay to Arab states a "tax" and this "tax" is based on a national "posted" price.

These "taxes" are offset, dollar for dollar and pound for pound, against tax liabilities in the United States and the United Kingdom. As a result, in Britain alone, nine big companies have already piled up more than $3 billion in tax "losses" to wipe out levies on future profits from the North Sea.

With characteristic British restraint, the parliamentary committee called this "unsatisfactory." It also regarded as "unsatisfactory" the fact that the ministry could not examine the companies' costs in the North Sea.

In the House of Lords, Balogh was less restrained. The committee's findings, he said, underscore "one of the most scandalous and costly derelictions of duty by ministers and their officials advisers." He called the report "a warning to bureaucrats that their follies would not go unnoticed."

The chancellor of the exchequer, Anthony Barber, has now promised to close the loophole. It becomes bigger every time the price of oil rises or the Arabs increase their take from the national posted price.

The affair is one more example of the fog that hangs over the North Sea's potential. Whatever energy resources do exist in the basin, they are clearly much more than official versions now allow. Policies based on the assumption that Europe must remain indefinitely in thrall to Arab oil may fit the plans of major oil companies. Whether they reflect the facts is a still unanswered question.

Mr. Jackson. Mr. President, I am pleased to cosponsor the Energy Information Act introduced today by the Senator from Wisconsin (Mr. Nelson). The enactment of this legislation is important to our present efforts to solve short-range energy problems, and is absolutely crucial to our goal of identifying and solving energy-related problems in the future.

In the past months, as many of us struggled to construct a clear picture of the U.S. energy supply system, our almost desperate need for accurate, complete and timely statistical information has been painfully obvious. Severe, short-term shortages are upon us. Government has a tremendous responsibility to see that these shortages are borne equitably and that damage to the economy is minimized.

But in undertaking this task, we in the Congress are at a terrible disadvantage. The gathering of energy information by the Federal Government is in such a chaotic state that is has been possible for industry spokesmen to charge repeatedly that Members of Congress and the executive branch do not under-

stand the energy supply system. The implication is that energy policy ought to be made by energy industries.

Given the disastrous shortages we face this winter, no Member of Congress could advocate such an abrogation of responsibility. We have to act on the basis of the best information available from Government, industry, and public sources.

Mr. President, a prime example of the deficiencies in our access to critical energy information is the apparent rapid growth in our dependence on Arab sources of petroleum during the past year. According to the Bureau of Mines, direct dependence on Arab crude oil and products averaged some 0.560 million barrels per day during 1972. This represented 3.4 percent of the total U.S. consumption during 1972 of 16.5 million barrels per day.

Early in the fall, as the Mideast war began, the best data available from the Bureau described imports for the second quarter of 1973 and showed a direct dependence on Arab sources of 0.910 million barrels per day, or approximately 5.3 percent of the 17.0 million barrels per day U.S. consumption. The important deficiencies in this data are:

First, it is not timely. We now know from analyzing raw census figures, that direct dependence on Arab imports for September 1973 was over 1.2 million barrels per day—approximately a third larger than in the second quarter—and over 7 percent of consumption.

Second. It is not complete. There is no way to use available data to derive the significant indirect dependence on Arab sources through imports of products from refineries abroad which use Arab crude. Even though these refineries are run either by U.S.-based companies or companies which do significant business in the United States, our Government does not monitor, on a continuous basis, the flow of petroleum through them to the United States. We now know that this indirect dependence in September was probably at least 1.2 million barrels per day, increasing our dependence on Arab sources at that time to over 2.4 million barrels per day, or almost 14 percent of consumption. Thus, when the war broke out in the Middle East, the very critical information relating to U.S. dependence on Arab oil was greatly in error. This situation led to the escalating estimates offered by the administration during October:

On October 12, White House Aide Charles Di Bona estimated dependence at 1.2 million barrels per day.

On October 20, the estimate was raised to 1.6 million barrels per day.

On October 24, it went to 2.0 million barrels per day, and on October 30 to 2.5 million barrels per day.

Now, in the middle of winter when demand for petroleum is at its highest, the amount of oil we might have received from Arab sources could undoubltedly be higher still. But the important point is that the administration and the Congress should have been aware of the petoleum situation when the war broke out. The fact is that important information was simply not available, and the information which was available existed only in unorganized bits scattered in different Federal offices.

The Congress cannot allow energy policymakers to render their decisions and recommendations on anything less than the most complete and timely information. Similarly, Congress cannot allow energy policymakers to flounder in a seemingly endless sea of incoherent and contradictory numbers, graphs, charts, and diagrams. The bill which the Senator from Wisconsin (Mr. Nelson) is introducing today will give Congress the opportunity to solve both of these problems.

Beyond the present crisis, it is the considered opinion of nearly all those who work in this area that energy scarcity, over long term, will impose continuing and important responsibilities on the Congress for the management of energy policy. Any attempt to carry out these responsibilities without the kind of fundamental information which the Bureau of Energy Information would provide will place the Congress in an impossible situation. This legislation is an essential first step in equipping Congress and the executive branch with the tools which they urgently need to formulate and carry out public policy with respect to energy resources and supply.

To obtain an adequate understanding of the flow of energy through the U.S. economy, statistical information is required at several junctures in the system. In the case of petroleum, for example, we need to know, among other things, the extent and location of existing petroleum reserves, the potentials for

achieving various rates of extraction, the rate of flow of crude oil from the wells to the refineries by pipeline or by tanker, the refinery throughput capacities, and the various product yield ranges. To understand the distribution of petroleum products, we have to know transport capabilities and stock levels and the structure of the transportation network which supplies fuel to various users.

At the consumption end, we should know who the big users of fuels are, both on an individual level and in terms of significant consuming sectors. Additionally, we need to know the levels of efficiency with which fuels are converted and the potential for substitution of alternate fuels by these users.

In connection with each point at which we collect information on the basic operation of the supply system, information about operating costs, environmental costs, and profit levels for existing and alternate technologies are essential if we are to understand how the system works and how policy should be written to govern it. We need all this information, and we need it in an organized and usable form available at a central location in the Federal Government.

A second vital area in which we must expand our collection of energy information is in estimating the resources owned by the Federal Government in the public lands. These are truly national resources, belonging to the people of the United States. They will undoubtedly be developed, for they provide the only possibilities for significantly increasing our domestic energy supplies. Unless the Congress and the executive branch have adequate knowledge as to the extent of these resources, it will be impossible to plan adequately for the future and to fix reasonable compensation in the transactions with the private companies which must do the developing. If we are to decrease our dependence on foreign energy sources significantly over the coming years, the resources owned now by the people of the United States will be an extremely important ingredient in our mix of new supplies. We must begin the inventory of these resources to determine the extent of the contribution they can make.

Mr. President, this bill will go a long way toward filling what, in some instances, is an information void, and in other instances is unintelligible information overkill. The bill being introduced today is an expanded version of an amendment offered by the Senator from Wisconsin (Mr. NELSON) last summer during the debate on S. 1081. At that time, I respectfully requested that the Senator withdraw his amendment, in hopes that we could work together and draft a more comprehensive bill and begin hearings on it before the end of the year. The distinguished Senator from Wisconsin (Mr. NELSON) graciously honored my request and withdrew his amendment in light of this understanding.

The bill introduced today fairly represents, I believe, a melding together of the amendment offered by the Senator from Wisconsin with the expanded format that I felt was necessary to deal effectively with the problems posed by inadequate energy information.

Put in simplest terms, Mr. President, the purpose of this bill is to provide for the improved collection, organization, coordination, and dissemination of energy information by a National Energy Information System. This system is to be operated and maintained by a census-like Bureau of Energy Information established within the Department of Commerce. The Bureau will have the authority to collect and coordinate energy information from the public domain—information collected now by some 64 Federal agencies and commissions—and essential information available only from private industry and/or its trade associations. The Bureau, like the Census, is intended to collect and organize energy information in an atmosphere of strict impartiality, with ample protection for reasonable competitive equities and national security. In particular, the primary function of the Bureau will be the collection of statistical information which can then be used by Congress, Federal agencies, and commissions in preparing analyses essential to the formation of policy.

The information collected will be stored in three libraries: the public library, the confidential library, and the secret library. The reason for such a system. Mr. President, is to insure that while the public will be guaranteed access to the vast majority of the information collected by the Bureau, reasonable competitive equities and national security will not be adversely affected and can be protected by placing "senstitive information" in either of the latter two libraries.

In addition to the information-collecting activities of the Bureau, the bill provides for a series of studies to be undertaken by the Bureau in an eort to improve the quality of the energy information collected and improve the coordination between the many agencies and institutions which now gather and report energy information.

Mr. President, a bill of this scope and complexity is, admittedly, very difficult to draft. It is my hope that when hearings are held on this bill in January, my colleagues in the Senate will offer constructive suggestions and comments that will improve this legislation. It is also my sincere hope, Mr. President, that my colleagues in the Senate share my sense of need and urgency for this bill. I feel that the enactment of this legislation is necessary if the Congress and the public are to understand the energy supply system, and have the capability of directing its operations toward the enhancement of the public good.

Chairman PROXMIRE. Senator Nelson, when the head of the Federal Energy Office, Mr. Simon, was here, I asked him about your bill and he expressed some hesitancy about it, he indicated that he favored the principle of the bill but he recognized that there were some problems involved. At the time the bill was being discussed apparently he indicated some reluctance to support it.

What is the reason for Mr. Simon's reluctance and on what points do you differ?

Senator NELSON. Well, I haven't seen his testimony. I would assume he might disagree with the bill on the question of how much public disclosure there should be of reserves that a company has; that is, disclosure by name of the company. I think that that is probably the issue. I am assuming that no one could reasonably defend the proposition that the Government should not know what the reserves are.

Now, if it were the position of Mr. Simon that in fact the Government should not have the right to require sworn statements from companies and should not have the right and the capacity with its own geologists to examine the estimates and the methodology of estimating reserves of a particular company, I would disagree with him. I would assume that nobody would want to be in the position of saying the Government should not be able to do that, on the fundamental principle that we are dealing with a resource upon which the survival of our system depends. Surely you cannot leave it up to the private sector to decide what the Government will know about the resources that will decide whether or not the whole economic, social, cultural, industrial system collapses.

If we had had this information and had been established to report it and bring it to the public attention some years ago, as many resource people were advocating, we would not be in the situation we are in today. In fact, if we had had this information and this legislation 20 years ago, the Research and Development Act authored by Senator Jackson and recently passed by the Senate very quickly, calling for the expenditure of $2 billion a year in R. & D., would certainly have passed no later than 1955 instead of 1973. The warnings had been coming prior to 1955 that we were going to run into an energy crunch, and if we had had the kind of information the Energy Information bill would provide us, and if it had been brought to the attention of the Congress on a formalized basis, then we would have passed something like the Jackson R. & D. legisla-

tion 15 years earlier than we did. We would have been in the field of R. & D. on coal liquefaction, gasification, geothermal energy, research, solar energy research, a whole number of fields. We would have been active for the past 15 years because, if the public had understood and Congress had understood what we were running into, we would have acted then instead of now.

So I am assuming that nobody will be appearing here to say that the Government of the United Sates is not entitled to know what our resources are, even on our own public lands, offshore or elsewhere.

So I think probably the issue with Mr. Simon most likely revolve around the question of how much of this information should be disclosed to the public by name of the company. In other words, when the Government finds out that Exxon has a certain number of millions or hundreds of millions of barrels of oil reserves underground, or has so much gas underground, should they identify it publicly?

I don't think it makes any difference to the company. I think it is a phoney issue. I think that Standard Oil of New Jersey knows as much about Exxon reserves as Exxon does and I think Exxon knows as much about Standard Oil of New Jersey. After all, all you have to do is watch the interchange of personnel between the two companies.

General Motors won't tell us how much it costs to build a car, or how much it costs for the metal or how much it costs for the labor, but General Motors executive and engineers are being hired by Ford and Chrysler each year, and vice versa, and they do not leave behind them the knowledge they gained when they were there. And the same is true in the oil companies. I doubt very much whether the issue is really an issue of proprietary right for competitive reasons between the competing companies. I think the real reason is they do not want the public to know.

In any event, I would think that would be the issue mainly in dispute. But certainly there can be no dispute about the public and the country knowing how much reserves we have of gas and oil and coal and any other energy source.

Chairman PROXMIRE. Has there been any representation made to you as to what specific damage, what harm, will be done to the companies if this information on reserves, for example, is disclosed or this information on costs is disclosed?

Senator NELSON. Not recently, but I think it is the traditional, classic proprietary right argument, in which industry says: "We have a proprietary right here to this information and it should not be disclosed because it will adversely affect us with our competitors."

Chairman PROXMIRE. In any event, you will provide in your bill if there were any adverse effect on the companies, if that could be shown, and if disclosure of the information were not essential to the national interest, then it could be classified either as confidential, in which case it would be available only to certain government officials, or secret, in which case it would be available only to a few government officials who would have to have it in order to compile data or in order to act?

Senator NELSON. Yes; if it is really a question of proprietary right, which would affect their competitive position, and if there is

no conflict in the public interest, then it would be classified and not made public.

Chairman PROXMIRE. I would assume that the reason for their objection would be that they would be concerned that the public interest might suggest that if information should be disclosed that might be damaging to their competitive position, is that a possibility?

Senator NELSON. I assume that that is what they are talking about.

I want to repeat, however, that none of the information about how much of any resource we have, that is, the question of the total amount, none of that should be withheld from the Government or the public. They might have some argument for saying that is all right but don't identify how much we have by comapny name. That is an issue on which we will have to take some rather extensive testimony. But the heart of the matter is to find out how much we have got and to have the public know how much we have got, and in those areas where there may be a valid question of a proprietary right, to allow whatever that information is, and I cannot imagine exactly what it is, not to be made public by company name.

Chairman PROXMIRE. I have some additional written questions for the record [1] but I also have one or two I would like to ask now.

Your bill, as I understand it, requires the Interior Department to gather data about the reserves and resources on public lands, including making on-site surveys. I am talking about public lands. What authority does the Interior Department have to do this and to what extent is that authority being utilized?

Senator NELSON. Well, counsel says that on the public lands they may have authority now, but mostly don't use it, and on private lands, they don't have the authority.

Chairman PROXMIRE. Do you agree that with respect to the public domain the Government should have its own exploratory and analytical capacity for determining the extent and quantity of resources, it should not have to rely on private industry for knowledge in this area on its domain?

Senator NELSON. I think the Government should have it on both the public domain and private domain.

Chairman PROXMIRE. Finally, as I understand your bill, it would not take current functions away from existing major statistical agencies, the Bureau of Labor Statistics would continue to gather statistics on prices and employment in energy industry, the SEC would continue to gather the corporate business information it does now, however, this information would be made available to the Energy Information Bureau and added to their public libraries. Is that the case?

Senator NELSON. Yes, sir.

Chairman PROXMIRE. Congressman Conable.

---

[1] See response of Senator Nelson to additional written questions posed by Chairman Proxmire, beginning on p. 234.

Representative CONABLE. Senator, at the outset let me say I hope Standard Oil of New Jersey and Exxon don't get into a dispute over this. I think it unlikely they will because they are the identical company.

Senator NELSON. These big companies change their names so often. I realized when I said it I was talking about the same company. That is probably another technique for confusing us.

Representative CONABLE. It appears quite likely that there is very substantial agreement between you and the other proponents of your bill and the administration about the need for this and I hope we can move promptly and with cooperation to get some sort of enacting legislation requiring mandatory reporting, something that will not bog down into any protracted dispute relating to the matter of degree, but as it does appear that one of the first steps we must take if we are to resolve the confusion the American people feel about fragmentation and frequently contradictory reporting is to build a sound base, and that this first step should have full cooperation and I hope that you will work as closely with the administration as it appears to be likely to advance that goal. And it shouldn't be erased between conflicting political interests at this point because the public does have grave concern about what the facts are.

That is not a question, that is a statement and a hope.

Senator NELSON. I would agree with that.

Representative CONABLE. I would like to ask you one thing, sir. In your statement you refer to an FTC official statement regarding some natural gas reserves and underestimates of those reserves up to 1,000 percent being reported to or by the Federal Power Commission.

Can you tell us the name of the FTC official, when and where he made the statement, what information he based it on? We would be interested in that because we heard very similar testimony regarding underestimates of oil reserves from Ralph Nader last week and this kind of statement is very disturbing to the public.

Senator NELSON. Yes, the statement was made before Senator Hart's subcommittee last sumer by Mr. James Halverson, Director of the Bureau of Competition of the Federal Trade Commission.

Representative CONABLE. Bureau of Competition?

Senator NELSON. Director of the Bureau of Competition, Federal Trade Commission, Mr. James Halverson. It was before Senator Hart's hearings last summer. I do not have the date at hand.

Representative CONABLE. Thank you very much, Senator. That is all, Mr. Chairman.

Chairman PROXMIRE. Well, thank you very, very much, Senator Nelson. It was most helpful and we deeply appreciate it.

Your legislation is precisely the kind of legislation that our hearings are designed to explore and to develop information on and we certainly need it and you have made a devastating case, if we had had this kind of information in the past our problem would not be nearly as acute as it is today.

Representative CONABLE. Thank you very much, Senator Nelson.

[The following information was subsequently supplied for the record:]

RESPONSE OF HON. GAYLORD NELSON TO ADDITIONAL WRITTEN QUESTIONS POSED BY CHAIRMAN PROXMIRE

Question 1. I note that the new Energy Information Bureau set up by your bill would be located in the Department of Commerce. That raises several questions:

Why not the new Energy Administration? Why not the Interior Department?

Why not the FTC? The FTC has been suggested by others because it already has responsibility for collecting certain similar business information. Hopefully it is expanding this activity with its proposed "Line-of-Business" reporting, which would give data on sales, profits, etc. by product line. Also the FTC is an independent regulatory agency and, under an amendment to the Alaska pipeline bill, it no longer needs OMB clearance for its questionnaires. However, I note that section 703 (d) of your bill does impose on OMB the requirement to approve forms speedily—a very important provision.

Answer. The Senate Interior Committee has now completed four days of hearings on S. 2782—hearings which were still in the future on Jan. 21. Considerable testimony was received on the issue of where in the Federal Government the proposed National Energy Information System should be placed.

The energy information bill, S. 2782, was drafted as a joint effort by Senator Jackson and me as an enlargement of the concepts first put forward as the "Mineral Fuels Reserve Disclosure Act." That proposal was offered in two alternative versions, which were drafted as amendments to the Alaska pipeline bill. The first version (S. Amendment 303, 93d Cong.) placed the responsibility for operation of the information function in the Federal Trade Commission. The reasoning for that placement—my own initial choice—was much as stated in your question. The second version of the amendment (S. Amendment 319, 93d Cong.) placed the responsibility in the General Accounting Office, primarily in the interests of consistency with the Senate-passed Energy Policy Act, S. 70. In drafting S. 2782, Senator Jackson and I chose an independent new bureau of the Department of Commerce, to be a co-equal sister agency of the Bureau of the Census, as a good, neutral site for the information function. Our reasoning was that the information-gathering and analysis function would be done better if it were completely divorced from regulatory functions—a consideration which, if accepted, would rule out the new FEA (Federal Energy Administration) as well as the FTC and the FPC.

The Nixon administration is now strongly supporting the FEA as the best interim home of the National Energy Information System, and the proposed new Department of Energy and Natural Resources as the best permanent home. It is the administration's position that the regulatory and data-gathering functions should not be separated. Testimony at the hearings on S. 2782 was divided on the issue, with witnesses of equal credentials arguing for and against the desirability of divorcing the long-term, analytical information function from the regulatory function.

The Departments of Commerce and Interior were both criticized, by some witnesses, as inappropriate places for the new information function, because of their advocate-client relationship with industry.

In the course of much discussion to date, the Senate Interior Committee has most recently leaned most strongly in the direction of creating a new, entirely independent agency, the National Energy Information Administration, which might even—and probably should—be made an agency of the Legislative rather than the Executive Branch of Government.

Increasingly I tend to favor that approach myself, for these reasons:

(1) The FEA will necessarily have an information-gathering and analysis function of its own, sufficient to meet its own needs. The main criterion for success of FEA's information arm will be whether it provides support for FEA's policy functions and administrative directives. FEA's information arm will always and necessarily be most concerned with answering the energy information questions of the FEA administrator, and those will often be short-term, today's-energy questions.

(2) Congress, the public, the press, small business all need a source of expert answers to their hard questions involving energy information. An independent National Energy Information Administration within the Legislative Branch could meet the need, and meet it more effectively than a mere arm or bureau of a regulatory agency in the Executive Branch. The NEIA, having access to all the basic data now collected in and out of Government, having the expert personnel and equipment required to make independent analyses and evaluations of data, and—most important—having no affiliation with any policy maker or policy or regulation, could perform a uniquely valuable function.

The NEIA would engage in model-building and report-writing, and its models and reports would be available to everyone. Congressional committees could exercise oversight functions. The criteria by which the success or failure of the agency would be judged would be, first and foremost, whether it was able to answer questions in a prompt and credible manner, whether it was able to make predictions that the passage of time would prove to have been correct, whether it was able to meet the energy information needs of all parts of the Government, industry, the press and the public, to the extent they were not able to meet those needs themselves.

(3) Very soon now, the country is going to need an information system covering all resources: protein, metals, water, fibers, and the industry that extracts, transports, processes and distributes all the necessities of human life and advanced technological society. In other words, the National Energy Information System proposed by S. 2782 will very shortly need to be redesigned and expanded into a National Resource Information System. Whatever arguments might be offered to put a National *Energy* Information System into the Federal Energy Administration, they can hardly apply to a National *Resource* Information System. This is probably the strongest argument of all against the Nixon Administration's position that the NEIA should be placed in FEA. Since the Jan. 21 hearing before your subcommittee, incidentally, I have introduced S. 3209, the National Resource Information Act, to accomplish that very purpose. The bill is pending in the Committee on Government Operations.

Question 2. The Director of the Bureau you propose would be subject to Senate confirmation, as is the Director of the Bureau of the Census. However, both these Bureaus would be under the Social and Economic Statistics Administration, and the head of that Administration is not subject to Senate confirmation. Presently that office is occupied by a Mr. Edward Failor, whose only known qualification is that he is a loyal Republican. Would it not be desirable if that office were also subject to Senate confirmation.

I presume you envisage that the Director of this new Bureau would be a competent, non-partisan professional? I know you are familiar with the reluctance of the present Administration to make non-partisan professional appointments to the statistical agencies. I would put great stress on building a legislative history about the kind of person we want in this new job.

Answer. I agree with all these points. The Social and Economic Statistics Administration was created, not by statute, but by a departmental order (Department Organization Order 35–4A) signed on Dec. 23, 1971 by then Secretary of Commerce Maurice H. Stans. The order transferred to the new SESA, as its major components, the Bureau of the Census and the Office (renamed "Bureau" by the order) of Business Economics. The effect was to make the Director of the Census, a statutory office requiring presidential appointment and Senate confirmation, co-equal with another newly-named "Bureau" director and subordinate to a newly created Administrator, neither of whose offices has statutory standing nor requires Senate confirmation. It would probably be most useful for the Congress to provide, by law, for presidential appointment and Senate confirmation of both the SESA Administrator and the Bureau of Business Economics Director. While the energy information bill, S. 2782, does not take those steps, it does provide for presidential appointment and Senate confirmation of the position of Director of Energy Information, which would be a statutory office on a par with that of Director of the Census.

The bill also provides, in section 104, that the Director of Energy Information will be a person "who, as a result of . . . training, experience, and attainments, is well qualified for this position." The chairman's suggestion that this explicit provision of the proposed statute should also be buttressed by a strong legislative history on the point is well taken.

Chairman PROXMIRE. I would like to ask the next three witnesses to come forward as a panel. We are very fortunate to have these distinguished men: John B. Rigg, Deputy Assistant Secretary, Department of Interior; Julius Shiskin, Commissioner, Bureau of Labor Statistics, and John Hodges, Director of Statistics, American Petroleum Institute.

Suppose we proceed with Mr. Rigg first, Mr. Shiskin second, and Mr. Hodges last. May I say in view of the fact we have you three gentlemen and we would like to question you, if you could confine your remarks, if possible, to about 10 minutes, and your full prepared statements will be printed in the record and we would appreciate that very much.

Mr. Rigg, I guess you had two statements and one I presume you are going to present and one is for the record, is that right?

Mr. RIGG. That is right.

Chairman PROXMIRE. They will both be printed in full. Please proceed, Mr. Rigg.

STATEMENT OF HON. JOHN B. RIGG, DEPUTY ASSISTANT SECRETARY, DEPARTMENT OF THE INTERIOR; ACCOMPANIED BY V. E. McKELVEY, DIRECTOR, U.S. GEOLOGICAL SURVEY; JOHN D. MORGAN, JR., ACTING DIRECTOR, BUREAU OF MINES; BILL ELLIOTT, DIVISION OF FOSSIL FUELS, BUREAU OF MINES; AND ROBERT RIOUX, CONSERVATION DIVISION, U.S. GEOLOGICAL SURVEY

Mr. RIGG. Mr. Chairman, I wish to tell you I have accompanying me today here Mr. V. E. McKelvey, Director of the U.S. Geological Survey; Mr. John Morgan, Acting Dirctor, Bureau of Mines; Bill Elliott, Division of Fossil Fuels, Bureau of Mines; and Robert Rioux, Conservation Division, U.S. Geological Survey.

It is a pleasure to appear before you and this subcommittee to describe the activities of the Department of the Interior with regard to the collection and publication of statistics on energy minerals. With your permission I shall submit a prepared statement for the record, and confine my oral remarks to the highlights of the more detailed prepared statement.

In the face of the current energy situation, we are aware of the need for accurate and quickly obtained information on refinery data and stocks and other energy information.

New methods are currently under review in the executive branch and we expect to forward our recommendations to the Congress shortly.

In his address of Saturday, January 20, President Nixon said:

> I will propose legislation requiring companies to provide a constant accounting of their inventory, their production and their cost and their reserves. This legislation will make it possible for the Federal Government to monitor these supplies independently.

Pending this action, Administrator Simon has announced that the Federal Energy Administration has begun its own audits of refiners stocks as well as compliance with Federal price ceilings.

For many years the Bureau of Mines has engaged in the collection, assembly, analysis, and publication of a large amount of data on all of the energy minerals: Coal, natural gas, petroleum, and uranium.

In addition data are also collected on helium and two minerals of potential use as sources of energy, oil shale and thorium. The data collected and published by the Bureau are extensively used at all levels by public and private agencies and individuals. They are derived from a wide assortment of collection points and procedures: Voluntary industry canvasses, exchange information from State agencies and other Federal offices; personal contacts with industry leaders; publications and meetings of trade associations and professional socieites; U.S. Geological Survey resource reports; special studies, by our personnel and under grants to universities, and numerous other individual contacts, both foreign and domestic.

The data collected are assembled and published in a number of forms the best known of which are fuel commodity sections of the annual "Minerals Yearbook," a series of mineral industry surveys dating from 1883. Numerous monthly, quarterly, and annual reports describe current operations of production, processing transportation, consumption and sales, and foreign trade as they relate to energy minerals. A periodic survey of the mineral industries, "Mineral Facts and Problems," is published every 5 years, with a chapter dedicated to each of the fuel resources. In addition, a large number of monographic reports on specialized aspects of energy minerals are published each year.

We believe that in general the data provided by this effort have been adequate in the past. Analysis of the information provided led scientists and engineers into research on oil shale and coal gasification with sufficient leadtime to develop invaluable basic knowledge for current expanded research in these areas. Metallurgical and mining research programs also were guided into such useful research as that on special property materials for nuclear energy generation and on advanced mining methods for coal and oil shale.

Industry has made wide use of Bureau data for commercial decisions. Although it is difficult for us to measure the data's adequacy for such use, our working relationship with industry invites criticism, comment, and suggested improvements. The system is not static, but responds to expressed changes in requirements. Our confidence in the adequacy of the information system was supported by a survey in 1968 by Opinions Research Corp. on Bureau of Mines statistical publications. The survey revealed that the diverse audience for these reports found them generally adequate.

There have been special circumstances, however, under which rapid change has overrun the ability to adapt to new and sometimes critical requirements. In wartime, data collection has had to be expanded to meet needs of defense agencies. When the envirionmental and land-use issues blossomed almost overnight, they revealed shortcomings in our basic data that have not yet been fully overcome.

We do believe we have met Interior's and congressional needs in these areas, but have found it difficult and costly to satisfy EPA.

The latest test of adequacy is the energy crisis. Its approach was clearly evident, and Interior Department officials have warned of its

coming for many years—repeatedly and specifically warned against the hazards of dependence upon foreign oil supplies.

In early 1973 the "Second Annual Report of the Secretary of the Interior Under the Mining and Minerals Policy Act of 1970" clearly described the unfavorable energy supply-demand trends confronting the United States. The report recommended several corrective governmental policy actions some of which have been taken under stimulus of the Arab oil embargo. Thus, in summary, hard data developed in Interior have been adequate to alert us to the hazard. Now that shortage has occurred, however, the data are insufficient to provide a basis for energy allocation, and it appears that the information system may be barely adequate for general longer term planning in the light of current uncertainties. We have requested additional funds to strengthen our capability.

In the course of reassessing our data collection functions in the light of the new requirements we have identified a number of problem areas. The design of a basic, practical, and effective information system to assess the consequences of policies, existing and potential, is a major problem. The system must be responsive to change and yet maintain continuity. The standardization of definitions, the format of statistical reports that limits items that can be collected, and the organization of primary data to improve its retrievability and usefulness are difficult problems because of the complexity of the energy industries.

Problems arise with the sorting of fact from conjecture in the statistical area. This is especially true in reserve reporting. Collection of data has been necessarily confined to the collection of information where there is a recognition of standardized definitions and of procedures such as are reported in the measured and indicated categories.

The capability to conduct analytical studies that could provide energy information essential to an adequate data system is seriously inadequate.

The matching of statistical information is a difficulty that confronts and often precludes good analysis. Current information systems have essentially been designed to serve specific purposes than being multipurpose. This limits the utilization of collected data. Improvements are being made but greater improvements are essential.

A recognition of a requirement for the need of proprietary information results in some limit to data collection. This is especially true in the cost-price and reserve information areas.

The cost of obtaining specific information as well as the time required are major problems. Although timeliness is essential, faster compilation of reliable indepth data on a national basis even for emergency purposes, is impractical under current reporting concepts when the magnitude of the energy industries is considered. Improvements also are needed in the relation of energy to smaller geographical areas.

Data relating to international operations of energy industries are seriously inadequate. Improvements in data collection, processing, analysis, and publication must be made. Standardization of defini-

tions and procedures or improvements in matching methods is a must in this area.

Mr. Chairman, in closing I would like to reiterate the two main points of my testimony this morning.

First, the products of the mineral intelligence effort in the statistical area have for the most part been adequate for Government and industry needs. However, at times, imposed limitations have deterred the collection of some desirable data and the development of related analysis.

Second, statistical requirements change from time to time, and the Department of the Interior data collection and analysis efforts have, within their funding limitations, been responsive to those changes.

This concludes my oral statement, Mr. Chairman, and I shall be pleased to attempt to answer any questions that you or the other members of the subcommittee may care to ask.

Chairman PROXMIRE. Thank you.

[The prepared statement of Mr. Rigg follows:]

PREPARED STATEMENT OF HON. JOHN B. RIGG

I. INTRODUCTION

My name is John B. Rigg. I am Deputy Assistant Secretary—Minerals, Department of the Interior. Under my jurisdiction are the United States Geological Survey and the Bureau of Mines. I am here to discuss the adequacy of the energy industry statistics.

The Bureau of Mines has the responsibility for collecting and publishing those statistics. To assess their adequacy, it is important that we understand the background and procedures used for data collection and analysis.

Secretary Morton is well aware that the statistical base for Government planning needs improvement. Indeed, in his Second Annual Report to the Congress under the Mining and Minerals Policy Act of 1970 he pointed out the problem that the U.S. Government information base for the conduct of its mineral responsibilities is grossly inadequate.

To an ever accelerating degree our Government must act promptly on questions of national and international concern involving mineral resources, reserves, production, use, and technology.

Government policies and programs are no better than the data upon which they are based.

In a free society government does not have detailed knowledge of many aspects of research, mineral reserves in private hands, investment plans, process details, etc.

Information on foreign mineral operations is even more fragmentary.

Currently information is scattered among a number of agencies: Interior, Commerce, Treasury, Securities and Exchange Commission, Federal Power Commission, Atomic Energy Commission, etc.

Secretary Morton indicated that the solution to the above problem was that government organization must be improved and streamlined, and cooperative measures must be developed so that information available in the public and private sectors can be brought to bear properly upon questions of concern to all.

II. BACKGROUND

History

The present Bureau of Mines procedures for data collection and analysis evolved from almost 100 years of collecting mineral information by many Government agencies. The first report of the U.S. Geological Survey, published 1880, states: " . . . mining cannot be prosecuted without drawing upon some industries for supplies and in its turn furnishing others with raw materials. This well understood interdependence of human pursuits makes it desirable for the public at large that information should be collected concerning many other features of the mining industry besides its mere production."

Under an arrangement with the Census Bureau, the Geological Survey was entrusted in 1880 with the first mineral census over the entire United States. "Mineral Resources of the United States, 1882" began the annual series that continues unbroken to the present (sinue 1932 as the "Minerals Yearbook"). The Survey continued its role of collecting mineral information through fiscal year 1925.

On July 1 of that year the data collection activities of the Survey were transferred to the Bureau of Mines which at the same time was transferred to the Department of Commerce. By fiscal year 1928, all mineral statistical surveys and economic inquiries formerly handled in the Geological Survey and the Bureau of Foreign and Domestic Commerce were consolidated in the Bureau of Mines.

In 1934, the Bureau of Mines was transferred back to the Department of the Interior. Some consideration was given to leaving the data collection function in the Department of Commerce, but it was finally decided to continue that responsibility in the Bureau of Mines.

Present organization

Many years of experience with various organizational forms have resulted in the present modus operandi of the Bureau's data collection and analysis activities. Basic to the system are the commodity and area specialists located at the Washington Headquarters. These senior employees are scientists or engineers with many years' experience in mining or related fields both with Government and private industry.

There are 80 specialists sharing the responsibility for 324 commodities and geographic areas monitored by the Bureau (110 commodities, 50 States, 5 U.S. territories or possessions, and 159 foreign countries). While this would indicate an average of four separate responsibilities for each specialist, only one would be assigned where the commodity or geographic area is of major mineral importance as, for example, zinc, West Virginia and U.S.S.R. These specialists live on a daily basis with their commodities and geographic areas. It is necessary for them to know and keep in contact with the key personnel in the industry, the production facilities, trade associations, and consumers of their particular commodity. For the States, they work closely with State Geologists, State Mining Bureaus, and other State agencies, other commodity specialists, and the Bureau of Mines State Liaison Officers. For foreign country assignments, they work with commercial and mineral attaches of foreign and U.S. embassies, with individual firms and international trade associations, and directly with governments involved.

The entire operation is under the direction of the Bureau's Assistant Director—Mineral Supply, operating through four commodity divisions, three supporting offices and four field offices. The specialists receive support from statisticians, economists and engineers both within their commodity division and also in the field offices. Staff support is available through the three Headquarters offices. All the offices and divisions become involved to varying degrees in specialized commodity or area studies. The manning table lists a total staff of 558, with 301 professional and 257 support personnel. Hiring freezes and budget restrictions, however, have kept personnel well below that level and as of the first quarter of fiscal year 1974 the total was about 100 below full strength. The operating budget for fiscal 1974 is approximately $11.5 million.

Energy industry statistics are primarily the responsibility of the Division of Fossil Fuels which has an authorized staff of 95 with 43 professional and 52 support personnel and a fiscal 1974 budget of approximately $2 million. The Division is organized into four branches, Petroleum, Natural Gas, Coal and Interfuels and Special Studies. The Uranium and Thorium Specialist is assigned to the Division of Nonferrous Metals.

Data collection procedures

The specialists in the four Bureau commodity divisions supported by the field and Headquarters offices utilize a large number of sources of information including:

1. *Voluntary Industry Canvasses*—monthly, quarterly, semi-annual, annual, 200 surveys, 150,000 responses.

2. *State Agencies*—State Geologists, State regulatory agencies, etc., aided by Federal-State cooperative agreements.

3. *Personal contact*—frequent visits in person and by telephone, and correspondence with industry leaders.
4. *Bureau of Mines State Liaison Officers.*
5. *Trade Associations*—publications, meetings, and conventions.
6. *Technical Societies*—journals and meetings.
7. *Federal Agencies*—Federal Power Commission, Department of Commerce, Federal Trade Commission, Atomic Energy Commission, etc.
8. *Published data*—periodicals, technical reports, foreign service dispatches, books, company annual reports and reports to the SEC and other agencies.
9. *Special Studies*—field investigation of selected industries or areas.
10. *U.S. Geological Survey resource reports.*—The Geological Survey provides information on the much broader category of "resources," and makes detailed special studies in support of assignments made by the Secretary. A recent example of a major Geological Survey resource study is Professional Paper 820, "United States Mineral Resources" issued in mid-1973. The Geological Survey requires, and makes available to the Bureau of Mines and the public, data on mineral production from mineral leases on Federal lands and the Outer Continental Shelf.
11. *U.S. Bureau of Mines reserve and resource reports.*
12. *Office of Oil and Gas Special Studies and Data.*
13. *Grants to universities for special studies.*
14. *United Nations reports.*
15. *Mineral and commercial embassy attaches.*
16. *Mining Enforcement and Safety Administration industry surveys.*

The data are reviewed, verified, and finalized by the specialists and published at least annually and often more frequently (monthly or quarterly). The annual "Minerals Yearbook," a statistical summary by commodity and by area, is recognized as the most comprehensive assemblance of mineral data available in the world. In addition, annual Commodity Statements are prepared for internal use and published in an edited edition every 5 years as "Mineral Facts and Problems." These statements not only review supply and demand historical data, but also consider the outlook—future supply/demand relationship. A section is included on reserves and resources and possible problems and future trends in the industry are predicted.

III. WHAT IS INFORMATION ADEQUACY?

This committee is making a specific and urgent inquiry. Although I am reluctant to introduce philosophic consideration that may divert us from our main course, I believe it is vital to an understanding of the diverse and shifting nature of informational needs for commercial and governmental decision-making. We can only measure information adequacy in the context of these shifting needs.

The mission of the mineral intelligence unit of the Bureau of Mines has been defined as follows:

"To collect, analyze, and disseminate mineral supply and demand information and evaluate means and costs of meeting national mineral objectives."

Measured against this mission the Bureau's energy information setup has for the most part been adequate. Analysis of this information led scientists and engineers into research on oil shale and coal gasification with sufficient leadtime to develop invaluable basic knowledge for current expanded research in these areas. Metallurgical and mining research programs also were guided into such useful research as that on special property materials for nuclear energy generation and on advanced mining methods for coal and oil shale.

Industry has made wide use of Bureau data for commercial decisions. Although it is difficult for us to measure the data's adequacy for such use, our working relationship with industry invites criticism, comment, and suggested improvements. The system is not static, but responds to expressed changes in requirements. Our confidence in the adequacy of the information system was supported by a survey in 1968 by Opinions Research Corporation on Bureau of Mines Statistical Publications. The survey revealed that the diverse audience for these reports found them generally adequate.

There have been special circumstances, however, under which rapid change has overrun the ability to adapt to new and sometimes critical requirements. In wartime, data collection has had to be expanded to meet needs of defense agencies. When the environmental and land-use issues blossomed almost over-

night, they revealed shortcomings in our basic data that have not yet been fully overcome. We do believe we have met Interior's and Congressional needs in these areas, but have found it difficult and costly to satisfy EPA.

The latestest test of adequacy is the energy crisis. Even with the advantage of hindsight, it does not seem that any set of physical facts would have forewarned us of the combination of events that precipitated the crisis. Nevertheless, in early 1973 the Second Annual Report of the Secretary of the Interior Under the Mining and Minerals Policy Act of 1970 clearly described the unfavorable energy supply-demand trends confronting the United States. The report recommended several corrective governmental policy actions some of which have been taken under stimulus of the Arabian oil embargo.

Thus, in summary, hard data developed in Interior have been adequate to alert us to the hazard. Now that a shortage has occurred, however, the data are insufficient to provide a basis for energy allocation, and it appears that the information system may be barely adequate for general longer-term planning in the light of current uncertainties. We have requested additional funds to strengthen our capability.

IV. THE ENERGY INDUSTRIES

Energy permeates the entire fabric of an industrial society. Thus, industries involved with energy range from those manufacturing the specialized tools needed to search for or produce fuels to the remote small store selling gasoline or heating oil to an ultimate consumer. Intermediary fossil fuels industries include the exploration firms, producers, extractors, transporters, refiners, importers, and distributors. One of the large associated energy industries is that of electric energy generation and distribution by public utilities.

The magnitude and diverse nature of the energy industries precludes combining them into a discrete unit for informational needs. The Department of the Interior has a long history of involvement in energy resources, energy minerals production and hydroelectric generation. Consequently, Interior has been held responsible for energy industries data collection in the part of the spectrum from exploration to production of mineral fuel commodities and on a limited basis, electric energy. In response to increasing need, the Department expanded its concern on a limited basis to distribution and consumption.

Departmental analytical efforts encompass nearly all of the energy industries. The initial data collection responsibility for some important elements, however, is properly assigned to other agencies.

V. ENERGY DATA COLLECTED AND PUBLISHED

Oil and gas

The Bureau of Mines conducts 26 separate industry canvasses involving the petroleum and natural gas industry. Ten of these are monthly surveys, 15 are annual and 1, Crude Oil Pipeline and Storage Survey, is on a 3-year basis. The number of establishments contacted range from as few as 12, District V Petroleum Supplement, to as many as 5,000, Fuel Oil and Kerosine Sales and Inventories.

Six monthly, 1 quarterly, and 8 annual Mineral Industry Surveys are distributed free to industry and interested Federal and State agencies. Data also are published in the annual "Minerals Yearbook" and every 5 years in "Mineral Facts and Problems."

The results of the Bureau of Mines canvasses of the oil and gas industry for operating data both monthly and annually on a voluntary basis have been highly satisfactory. A comparison of the information received in these canvasses with related data from other sources indicates a high degree of accuracy.

In the survey of the petroleum refining operations for September 1973 264 plants were canvassed, of which 250 reported. The operating data on the 14 unreported plants, representing 5.3 percent of all the companies canvassed, were estimated based on reports previously submitted by these companies. These estimated data amounted to 0.3 percent of the total crude oil refinery runs for the month. This reporting pattern is representative for other months. The accuracy and reliability of the survey is shown by a comparison of refinery crude runs to the supply of crude oil as indicated by State production figures and the amounts of crude imports.

In the face of the current energy situation, we are aware of the need for accurate and quickly obtained information on refinery data and stocks and other energy information. New methods are currently under review in the Executive branch and we expect to forward our recommendations to the Congress shortly. Pending this action, Administrator Simon has announced that the Federal Energy Administration has begun its own audits of refiners stocks as well as compliance with federal price ceilings.

In the case of natural gas, the Bureau's annual survey on natural gas consumption accounts for approximately 95 percent of the annual production reported by State agencies.

Coal

Eleven industry coal canvasses are conducted, 3 monthly, 1 quarterly, and 7 on an annual basis. Approximately 6,000 mining establishments are contacted for the Bituminous Coal and Lignite Survey. Response rate is poor, less than 30 percent, but those companies reporting produce over 85 percent of U.S. coal production. Data are verified by State reports.

Results of the surveys are published in 3 monthly, 1 quarterly, and 4 annual Mineral Industry Surveys. Two weekly Mineral Industry Surveys report bituminous and anthracite production as estimated from railcar loading information. Data also appear in the annual "Mineral Yearbook" and "Mineral Facts and Problems."

The Geological Survey and the Bureau of Mines estimate coal resources and reserves from a variety of data sources. A part of the data is from industry records, but the majority comes from original Survey and Bureau investigations, some of which date back to the turn of the century.

VI. OTHER SOURCES OF ENERGY DATA

A number of data sources other than Bureau of Mines conducted surveys are used in compiling energy statistics.

Atomic Energy Commission

For statistics on domestic uranium production, resources and reserves the Bureau relies on the AEC data. Until 1962 the AEC was the only market for uranium which it purchased from industry under negotiated contracts. These contracts required that the contractor reveal cost and other information to the Commission. After 1962 Government purchased only that uranium which had been developed into reserves by 1958. The owners submitted their detailed justification of their claimed reserves to the Commission and Government and industry geologists worked together to develop the final allocation. Through this procedure, an industrywide standard basis for reserve calculations was developed.

Although the last purchase contracts expired in 1970, the system developed in the late 1950's and early 1960's has continued on a voluntary basis to the present. Reserve and cost data are submitted on a regular schedule to the AEC and calculations are jointly reviewed by Government and industry. Strict confidentiality is maintained.

Selling prices are determined by a voluntary canvass of the utility industry which reports average annual contract prices for U_3O_8 on a 10-year forward basis. The AEC thus predicts price trends and estimates reserves at varying prices.

The AEC maintains a staff of about 65 at Grand Junction, Colorado, to operate its program. Resource estimates from nonoperating lands are prepared for the AEC by its contractor, Lucius Pitkin, Inc. (LPI). LPI, staffed by over 100 professional and support personnel, has a continuing contract for updating resource information.

American Petroleum Institute and American Gas Association

For domestic oil and gas reserves the Bureau relies on the annual studies of the American Petroleum Institute (API) and the American Gas Association (AGA). These two organizations each have created a reserve committee of senior executives from major companies to oversee the gathering of data and publishing of reserve estimates. The API has a 15-member committee and each member appoints one or more subcommittees for the purpose of preparing reserve estimates. The subcommittees are composed of approximately 175 geolo-

gists and engineers who (1) represent segments of the industry having prominent ownership holdings in the assigned area; (2) have broad experience in estimating reserves; and (3) have intimate knowledge of the fields assigned to them.

The AGA operates in a similar manner, but with about 100 subcommittee members. Thus, some 300 industry executive and professionals with a close association with the problem are involved in the oil and gas reserve estimates. Confidentiality of proprietary information is carefully guarded. The estimates are believed to be of high quality. A senior employee of the Bureau of Mines is currently a member of the 15-man AGA reserve committee.

State agencies

Coal, crude oil, and gas production data are compiled from State reports by the Bureau of Mines specialists. Although the coal mining industry is canvassed, the data obtained are used for determining mining methods, equipment used, and transportation modes rather than production statistics. These State reports are considered to be adequate.

Other Federal agencies

Largely for consumption data but also for imports and exports, the Bureau supplements its statistics with data from the following Federal Departments and Agencies: 1. Federal Power Commission; 2. Department of Commerce; 3. Department of Transportation; 4. Department of Defense; and 5. The Department of the Treasury.

VII. PROBLEM AREAS

The design of a basic, practical, and effective information system to assess the consequences of policies, existing and potential, is a major problem. The system must be responsive to change and yet maintain continuity. The standardization of definitions, the format of statistical reports that limits items that can be collected, and the organization of primary data to improve its retrievability and usefulness are difficult problems because of the complexity of the energy industries.

Problems arise with the sorting of fact from conjecture in the statistical area. This is especially true in reserve reporting. Collection of data has been necessarily confined to the collection of information where there is a recognition of standardized definitions and of procedures such as are reported in the measured and indicated categories.

The capability to conduct analytical studies that could provide energy information essential to an adequate data system is seriously inadequate.

The matching of statistical information is a difficulty that confronts and often precludes good analysis. Current information systems have essentially been designed to serve a purpose rather than being multipurpose. This limits the utilization of collected data. Improvements are being made but greater improvements are essential.

A recognition of a requirement for the need of proprietary information results in some limit to data collection. This is especially true in the cost/price and reserve information areas.

The cost of obtaining specific information as well as the time required are major problems. Although timeliness is essential, faster compilation of reliable indepth data on a national basis even for emergency purposes, is impractical under current reporting concepts when the magnitude of the energy industries is considered. Improvements also are needed in the relation of energy to smaller geographical areas.

Data relating to international operations of energy industries are seriously inadequate. Improvements in data collection, processing, analysis, and publication must be made. Standardization of definitions and procedures or improvements in matching methods is a must in this area.

VIII. SUMMARY

In conclusion Mr. Chairman, the problems are complex and we in Interior are determined to rearrange our priorities so that every possible effort is made to obtain accuurate and timely information, not only for the energy crisis in which we now find ourselves, but also, to avert, if possible, any parallel devel-

oping situation with respect to the non-fuel minerals on which our economy depends so entirely.

Chairman PROXMIRE. Mr. Shiskin, please proceed.

STATEMENT OF HON. JULIUS SHISKIN, COMMISSIONER, BUREAU OF LABOR STATISTICS, DEPARTMENT OF LABOR, ACCOMPANIED BY JANET NORWOOD, DEPUTY COMMISSIONER FOR DATA ANALYSIS; AND MARGARET STOTZ, CHIEF, WHOLESALE PRICE DIVISION

Mr. SHISKIN. Thank you, Senator Proxmire.

Like Mr. Rigg, I have a prepared statement, which I will read only part of, only an abstract of.

Also, I have with me Mrs. Janet Norwood, who is the Deputy Commissioner for Data Analysis of the Bureau of Labor Statistics, and Mrs. Margaret Stotz, who is Chief of our Wholesale Price Division.

As you may know, the BLS has great tradition for having distinguished women professionals in high positions and I am very pleased that the hearing today offered me an opportunity to bring two of them with me.

There are also other members of the staff present to support us in some of the more detailed questions that may come up.

I will now read my summary statement which will take about 10 minutes.

Mr. Chairman and members of the subcommittee, I welcome this opportunity to appear before your committee to discuss the efforts of the Bureau of Labor Statistics to improve wholesale and retail price data for petroleum products.

I found when I came to BLS last August that the staff was very much aware of the need for better information on petroleum prices and had been struggling hard to obtain it. However, neither they, nor I, anticipated early enough the speed with which these problems would become urgent.

This morning I would like to describe current BLS procedures for compiling the wholesale price indexes for refined and crude petroleum products, components of the wholesale price index—WPI—and efforts to improve them. In addition, I will describe briefly recent improvements in the accuracy and timeliness of retail gasoline price data.

The BLS wholesale price indexes for the major components of the refined petroleum index—gasoline, light distillate, middle distillate, and residual fuel oil—have for years been based on prices quoted in trade publications. These secondary source data have been used with great reluctance, since BLS policy is to collect data directly from companies wherever possible. Although we have long recognized the risks of using secondary data, we were unable to introduce direct collection for two reasons. First, the BLS relies completely on voluntary reporting in its price programs. We have no legal authority to compel companies to report price data to the Bureau.

BLS efforts to achieve the voluntary cooperation of the petroleum companies in past years have been unsuccessful.

Their reluctance was explained on the grounds that, until recently, the spot market data used in the WPI constituted a reasonably good indication of the price trend for refined petroleum products.

Second, secondary data is far cheaper than direct price collection, and the BLS has not been able to secure, as a part of its regular budget, adequate funds for the WPI.

Data used in BLS price indexes should be directly collected at the primary source. As is well illustrated by the present situation in the prices of refined petroleum products, shortcuts to save money on key statistical indicators do not pay in the long run.

Historically, the trend of the WPI for refined petroleum products, based on spot market quotations, was similar to that of retail prices. Events during 1973, however, appear to have changed the relationship of the spot market data to the total market. As shortages developed, domestic spot market transactions began to represent a declining portion of the total refined petroleum market and, thus, became a less reliable indicator of the total market.

I have a chart in my prepared statement which shows how wholesale prices and retail products moved quite similarly from 1967 to 1972 and then departed markedly in 1973.

We have called attention to our concerns over this index in the November and December WPI press releases, and will continue to do so until a new refined petroleum index is available.

In order to get an idea of the possible magnitudes involved, we have calculated a special WPI which removes the direct impact of price changes for refined petroleum products on the WPI. This special index increased 14.6 percent from December 1972 to December 1973, compared with an 18.2-percent rise in the published WPI.

The BLS began to develop a better index for refined petroleum products in 1972, with funds—and specifications—provided by the Office of Emergency Preparedness—OEP. This program, funded by OEP in fiscal years 1972 and 1973, was designed primarily to meet the contractor's—OEP—requirements. The OEP specifications were designed to yield both monthly average unit prices and price indexes.

It required the selected companies to adjust their recordkeeping.

Many companies were unwilling to make such adjustments and would not participate in the program. In addition, some companies were reluctant to report because they had reservations about the use of these data to compute average unit prices.

Many of the difficulties in this program have stemmed from our attempt to adapt and implement, on a voluntary basis, a program to meet OEP needs which would also be suitable for the WPI.

BLS options in this situation were limited because of the needs of the sponsoring agency, the attitude of the companies, and inadequate funds for the WPI.

It may be useful to note the BLS has received in its fiscal year 1974 appropriation an increase of $450,000 for the WPI. This increase of almost 50 percent of the total appropriation for the WPI will enable us to make many improvements.

In early 1973, the BLS tried to reduce the reporting burden and to provide more time for companies to adjust their accounting sys-

tems to the program's requirements. With OEP concurrence, the BLS concentrated on the collection of national data and temporarily discontinued regional data. Unhappily, the response rate did not improve markedly. In mid-1973, the OEP contract authorization expired.

In view of the public interest in these data, the BLS diverted fiscal 1974 funds from other WPI activities in order to continue this program, and made another effort to increase cooperation.

To pave the way for better reporting, a decision was made to concentrate on improving the measures of price change and to postpone development of average unit prices.

In addition, requests for data for some products were discontinued and some product descriptions were modified.

The BLS gave a top priority to this program and hoped to have had it operational by this time.

However, serious problems still remain. The most important is the timelag in the reporting of the data to the BLS. The WPI is released in the first week of the month following the month covered by the data, for example, on January 8 figures for December 1973 were released.

Volume and revenue data cannot be available until the month is over. Because of this time schedule, cooperating companies would, therefore, be unable to provide refined petroleum data without a timelag of at least 1 month. In fact, however, in most cases data are being reported with a 2-month lag.

Coverage of the industry has been another problem. At the present time only about half of the companies selected for the probability sample of producers have agreed to furnish the national data required.

Why do we request revenue and volume data covering the whole month, which results in lag, rather than average prices for a particular day as is the practice in most other parts of the WPI?

We are working intensively with the companies to resolve the coverage problem and to reduce the lag in reporting. We hope to introduce a better refined petroleum component in the spring, but I cannot specify any completion date today.

As soon as we can secure sufficient coverage to assure reasonable reliability and prompt reporting, we shall introduce the new data into the index. The timeliness requirement would necessitate that the cooperating companies currently reporting data speed up their reports from about 40 to 50 days from the end of the reference month to 15 days. And this would still leave us with a 1-month lag; that is, the report issued at the beginning of March covering February would use January refined petroleum products data.

We shall also make a more comprehensive study of direct price reporting and if that approach proves feasible and more timely we shall switch to it. About 2.7 percent of the weight in the WPI lags by 1 month and 0.5 percent by 2 months.

In addition to its work on refined petroleum, the BLS also initiated a program last year to expand and improve the pricing of crude petroleum for the WPI. For many years, BLS has directly priced domestic crude petroleum in six major producing areas of the

United States. Early in 1973, it became apparent that the price trends for these six major areas were no longer representative of price trends for areas not directly priced for the index. Therefore, we developed plans to expand the price coverage to include seven additional producing areas and began additional collection. This expansion from 6 to 13 directly priced areas will be reflected in the WPI beginning with the index for January 1974 to be released next month.

Although this testimony is concerned mainly with the WPI, I wish to take this opportunity to report that we have made important improvements in the gasoline component of the Consumer Price Index—CPI—and have begun publishing new retail price measures for gasoline.

In mid-1973, with funding from the U.S. Department of the Treasury, BLS started to improve the timeliness and accuracy of retail price data for gasoline. First, the retail gasoline sample was revised with greater use of probability techniques, and expanded in the 23 areas for which a CPI is published.

The total sample is now about twice as large and the sample in the 23 areas almost four times as large. Further, prices are now collected every month in each of the 56 cities in which price data are collected for the CPI.

Formerly they were collected quarterly in 42 of the cities.

In November 1973, we began the publication of new indexes of price changes and average retail prices for gasoline in each of 23 major metropolitan areas. In addition, we now have average prices at the U.S. level and improved U.S. indexes of price change.

Those are in my prepared statement. They were not published previously.

Cost data for the CPI, including the new material, will be released tomorrow.

I will now try with the help of Mrs. Norwood and Mrs. Stotz to answer any questions.

Chairman PROXMIRE. Thank you very much.

[The prepared statement of Mr. Shiskin follows:]

PREPARED STATEMENT OF HON. JULIUS SHISKIN

Mr. Chairman and members of the subcommittee, I welcome this opportunity to appear before your Committee to discuss the efforts of the Bureau of Labor Statistics to improve wholesale and retail price data for petroleum products. In these times of shortages and rising prices, the need for accurate and timely data is of utmost importance to the country. As you know, during my four years as Chief Statistician of the Office of Management and Budget, one of my major activities was to promote the speed-up in the publication of current economic indicators including the WPI and the CPI.

I found when I came to BLS last August that the staff was very much aware of the need for better information on petroleum prices and had been struggling hard to obtain it. However, neither they, nor I, anticipated early enough the speed with which these problems would become urgent.

This morning, I would like to describe current BLS procedures for compiling the wholesale price indexes for refined and crude petroleum products, components of the Wholesale Price Index (WPI), and efforts to improve them. In addition, I will describe briefly recent improvements in the accuracy and timeliness of retail gasoline price data.

CURRENT PROCEDURES FOR PRICING REFINED PETROLEUM PRODUCTS

The BLS Wholesale Price Indexes for the major components of the refined petroleum index—gasoline, light distillate, middle distillate, and residual fuel oil—have for years been based on prices quoted in trade publications. These secondary source data have been used with great reluctance, since BLS policy is to collect data directly from companies wherever possible. Although we have long recognized the risks of using secondary data, we were unable to introduce direct collection for two reasons. First, the BLS relies completely on voluntary reporting in its price programs. We have no legal authority to compel companies to report price data to the Bureau. BLS efforts to achieve the voluntary cooperation of the petroleum companies in past years have been essentially unsuccessful. The information we sought is detailed and comprehensive and many petroleum companies were unwilling to accept the extra reporting burden. Their reluctance was explained on the grounds that, until recently, the spot market data used in the WPI constituted a reasonably good indication of the price trend for refined petroleum products.

Second, secondary data is far cheaper than direct price collection, and the BLS has not been able to secure, as a part of its regular budget, adequate funds for the WPI. Generally, until a crisis occurs, it is extremely difficult to stimulate interest in improving statistical information and this has been especially true for the BLS data. Data used in BLS price indexes should be directly collected at the primary source. As is well illustrated by the present situation in the prices of refined petroleum products, short cuts to save money on key statistical indicators do not pay in the long run. The price statistics required for Government policymaking must be highly reliable at all times, so that when a crisis situation does come up, accurate and timely data are available to provide a sound basis for policymaking.

Historically, the trend of the WPI for refined petroleum products, based on spot market quotations, was similar to that of retail prices. Events during 1973, however, appear to have changed the relationship of the spot market data to the total market. As shortages developed, domestic spot market transactions began to represent a declining portion of the total refined petroleum market and, thus, became a less reliable indicator of the total market.

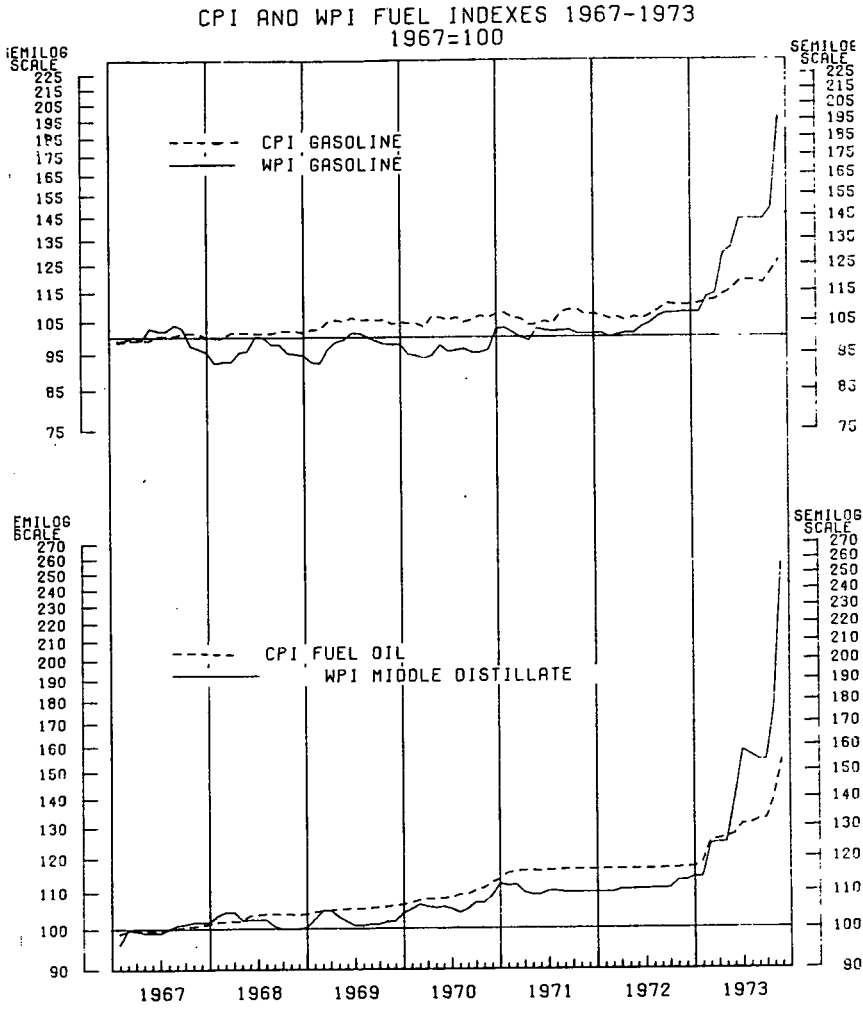
This deterioration in the representativeness of spot market data can be seen by comparing the WPI for gasoline, based on spot market prices, with the Consumer Price Index for gasoline. As can be seen in the accompanying chart, the two indexes tended to move together from 1967 and through 1972. The CPI increased 10 percent and the WPI increased 8 percent over this five-year period. During the first 11 months of 1973, however, the relationship changed dramatically. Gasoline prices increased 15 percent in the CPI, which they soared 82 percent in the WPI.

The same patterns held for heating oil, another component of the refined petroleum products index. A comparison of the WPI, based on spot markets, with the CPI, based on direct pricing, shows the heating oil component of the WPI rising about the same percentage as the heating oil component of the CPI from 1967 to December 1972. During the first 11 months of 1973, however, the retail price increased 32 percent while the wholesale index increased 125 percent. These comparisons suggest that the spot market prices used in the refined petroleum index overstated the price increase during 1973 and cannot be relied on as indicators of prices in the total market. While it is, of course, possible that it is the CPI which is off the mark, this seems less likely because the CPI data are collected directly from retailers.

We have called attention to our concerns over this index in the November and December WPI press releases, and will continue to do so until a new refined petroleum index is available. Let me quote the statement that has appeared:

"Prices for these products used in the index were chiefly quotations from spot markets which now, because of developments over the last few months, appear to represent a declining portion of the transactions taking place in domestic markets. The Bureau of Labor Statitics has underway a program to develop the price data required to improve the refined petroleum products component of the WPI."

In order to get an idea of the possible magnitudes involved, we have calculated a special WPI which removes the direct impact of price changes for refined petroleum products on the WPI. This special index increased 14.6 percent from December 1972 to December 1973, compared with an 18.2 percent rise in the published WPI.



THE NEW APPROACH TO PRICING PETROLEUM IN THE WPI

The BLS began to develop a better index for refined petroleum products in 1972, with funds—and specifications—provided by the Office of Emergency Preparedness (OEP). This program, funded by OEP in fiscal years 1972 and 1973, was designed primarily to meet the contractor's (OEP) requirements. The OEP specifications were designed to yield both monthly average unit prices and price indexes. This required the collection of revenue and volume data for 30 petroleum products at the wholesale distributor level from a probability sample of companies. Prices were to be derived from the revenue and volume data for the U.S. and nine geographic areas of the country. The collection of data for a large number of products by region required that the selected companies adjust their recordkeeping. Many companies were unwilling to make such adjustments and would not participate in the program. In addition, some companies were reluctant to report because they had reservations about the use of these data to compute average unit prices.

Many of the difficulties in this program have stemmed from our attempt to adapt and implement, on a voluntary basis, a program to meet OEP needs which would also be suitable for the WPI. The BLS tried to provide complex measures for one of the most complicated industries in the country at a time when companies were not convinced that the existing data were inadequate. BLS options in this situation were limited because of the needs of the sponsoring agency, the attitude of the companies, and inadequate funds for the WPI. (It may be useful to note parenthetically here that the BLS recently received in its Fiscal Year 1974 appropriation an increase of $450,000 for the WPI. This increase, almost 50 percent of the total appropriation for the WPI, will enable us to make many improvements.)

In early 1973, the BLS tried to reduce the reporting burden and to provide more time for companies to adjust their accounting systems to the program's requirements. With OEP concurrence, the BLS concentrated on the collection of national data and temporarily discontinued regional data. Unhappily, the response rate did not improve marked.y. In mid-1973, the OEP contract authorization expored. In view of the public interest in these data, BLS diverted fiscal 1974 funds from other WPI activities in order to continue this program, and made another effort to increase cooperation. To pave the way for better reporting, a decision was made to concentrate on improving the measures of price change and to postpone development of average unit prices. In addition, requests for data for some products were discontinued and some product descriptions were modified.

The BLS gave a top prioroty to this program and hoped to have it operational by this time. However, serious problems still remain. The most important is the time lag in the reporting of the data to the BLS. The WPI is released in the first week of the month following the month covered by the data, e.g., on January 8 figures for December 1973 were released. Volume and revenue data cannot be available until the month is over. Because of this time schedule, cooperating companies would, therefore, be unable to provide refined petroleum data without a time lag of at least one month. In fact, however, in most cases data are being reported with a two-month lag.

Coverage of the industry has been another problem. At the present time only about half of the companies selected for the probability sample of producers have agreed to furnish the national data required.

Why do we request revenue and volume data covering the whole month, which results in a lag, rather than average prices for a particular day as is the practice in most other parts of the WPI? One reason is the complexity of the production, marketing and pricing of petroleum products. Since prices for petroleum products differ among regions, it would be necessary to obtain data for all of the many, different marketing areas of each company included in the sample. In addition, petroleum companies sell to several different classes of trade, who are sometimes charged different prices. Furthermore, significant amounts of inter-company sales and transfers occur. Second, there are problems in trying to obtain representative price data. For example, average posted prices would not reflect discounts for some products. Finally, BLS has been reluctant to ask companies to change their reporting procedures so soon after obtaining their cooperation on the existing alternative program established for OEP purposes. We shall, however, make a more comprehensive study of direct price reporting, and if that approach proves feasible and more timely, we shall switch to it.

We are working intensively with the companies to resolve the coverage problem and to reduce the lag in reporting. We hope to introduce a better refined petroleum component in the spring, but I cannot specify any completion date today. As soon as we can secure sufficient coverage to assure reasonable reliability and prompt reporting, we shall introduce the new data into the index. The timeliness requirement would necessitate that the cooperating companies currently reporting data speed up their reports from about 40 to 50 days from the end of the reference month to 15 days. And this would still leave us with a one-month lag, that is, the report issued at the beginning of March covering February would use January refined petroleum products data. About 2.7 percent of the weight in the WPI lags by one month and 0.5 percent by two months.

DOMESTIC CRUDE PETROLEUM

In addition to its work on refined petroleum, the BLS also initiated a program last year to expand and improve the pricing of crude petroleum for the WPI. For many years, BLS has directly priced domestic crude petroleum in six major producing areas of the U.S. Early in 1973, it became apparent that the price trends for these six major areas were no longer representative of price trends for areas not directly priced for the index. Therefore, we developed plans to expand the price coverage to include seven additional producing areas and began additional collection. This expansion from six to thirteen directly priced areas will be reflected in the WPI beginning with the index for January 1974 to be released next month.

It should be noted that prices for imported crude oil are not included in the WPI at this time. The reason for this exclusion is that until recently, very little imported crude oil was sold in commercial markets. Most importers consumed the product within their own refineries. We viewed this type of transaction as an interplant transfer and, for that reason, considered it to be outside the scope of pricing for the WPI.

We have been encouraged with our progress in pricing crude petroleum. However, in the latter part of 1973 new complications arose. Late in August, the Cost of Living Council instituted a two-tier pricing system for crude oil. Under this system, "old" oil was controlled, and "new" and "released" oil were uncontrolled. Special procedures had to be developed to take account of this new pricing system. The effect of the two-tier pricing system has been reflected in the WPI since November. We are making every effort to assure that the ratio between controlled and uncontrolled crude oil used in in compiling the index is representative of market transactions.

RETAIL GASOLINE PRICES

Although this testimony is concerned mainly with the WPI, I wish to take this opportunity to report that we have made important improvements in the gasoline component of the Consumer Price Index (CPI) and have begun publishing new retail price measures for gasoline.

In mid-1973, with funding from the U.S. Department of the Treasury, BLS started to improve the timeliness and accuracy of retail price data for gasoline. First, the retail gasoline sample was revised with greater use of probability techniques, and expanded in the 23 areas for which a CPI is published. The total sample is now about twice as large and the sample in the 23 areas almost four times as large. Further, prices are now collected every month in each of the 56 cities in which price data are collected for the CPI. Formerly they were collected quarterly in 42 of these cities.

In November 1973, we began the publication of new indexes of price changes and average retail prices for gasoline in each of 23 major metropolitan areas. In addition, we now have average prices at the U.S. level and improved U.S. indexes of price change. Since these have not yet been published, I am providing them here for your convenience:

U.S. AVERAGE RETAIL PRICES FOR GASOLINE

	October 1973	November 1973
Regular gasoline	$0.492	$0.418
Premium gasoline	.439	.454

Average prices for each of the 23 major metropolitan areas were published in a press release which was issued December 21, 1973.

These data are being used in compiling the CPI each month and will be published in the Bureau's monthly report, "Retail Prices and Price Indexes for Fuels and Utilities." This report also contains information on other energy items including fuel oil, natural gas, and electricity. The December data will be released tomorrow.

My statement is concluded, and I will now try to answer your questions.

Chairman PROXMIRE. Mr. Hodges, you have a somewhat longer prepared statement than the other witnesses. I would appreciate it if you could limit the oral presentation to about 10 minutes and the entire prepared statement, which is a very useful and helpful statement, will be printed in full in the record, including the exhibits, at the end of your oral statement.

Mr. HODGES. And there may be other materials, Mr. Chairman, you might like to have that we will provide.

Chairman PROXMIRE. Very good.

Mr. HODGES. With your permission, my prepared statement, I assume, has been accepted for the record?

Chairman PROXMIRE. Yes, sir.

STATEMENT OF JOHN E. HODGES, DIRECTOR OF STATISTICS, AMERICAN PETROLEUM INSTITUTE

Mr. HODGES. I am director of statistics at API and the record shows I have had extensive experience both on the academic side and in industry as a collector of primary data and as a user of data pertaining to the petroleum industry.

Indeed, I have been involved with these matters since 1944, long before I came to the API.

Because of the current interest in this problem, I am pleased to review what the API is doing in this area. But before describing the program, I would like to emphasize that the API does not publish forecasts or make projections of any kind and we do not collect statistics on prices.

The first major element of our program is the weekly statistical bulletin.

This bulletin provides data pertaining to petroleum supply and refinery operations. In recognition of the importance of the time factor, the bulletin is usually published each Wednesday on the basis of information reported directly to us by the companies as of the previous Friday.

In order to put the bulletin in proper perspective it should be noted that the U.S. Bureau of Mines publishes monthly reports on the domestic supply system that are much more comprehensive than the API weekly reports.

However, their monthly reports run at least 2 months behind in publication. Nevertheless, the industry and I believe many Federal Government agencies consider the Bureau of Mines to be the definitive source of information of the types reported in their monthly petroleum statement.

It should be emphasized that the primary purpose of the weekly statistical bulletin is to provide the most timely information that can be collected covering selected operating series pending release of the definitive data by the Bureau of Mines.

Now we do not get as good a coverage as the Bureau of Mines and it has been customary for the API to introduce a factor to take our 90-odd-percent coverage and make an estimate for the total industry.

Exhibits A and B attached to my prepared statement show the percentages of volumes reported to the API against the Bureau of

Mines, and also shows a comparison of the accuracy of the data published by the API in relation to the Bureau of Mines.

We believe that this record shows that we have done an extraordinarily good job in this area.

The second report that we concentrate on is that pertaining to reserves. The API has been involved in this in an organized fashion since 1935.

In 1966, in response to a petroleum statistics report sponsored by the Bureau of the Budget, the work of this committee that prepares the reserves estimates was greatly expanded and also expanded to include estimates of productive capacity.

Now, there is a common misconception about API reserve estimates and how they are derived. I believe many people think that we take information submitted directly by the individual companies. In fact, estimates published by the API are prepared by highly qualified professional personnel who prepare individual and independent estimates of what proved reserves may be in their respective areas. The details of the organization of the API committees that actually do the work, and the procedures and definitions are set forth in exhibit C attached to my prepared statement.

The third major project in the division pertains to drilling costs and expenditures. In cooperation with the Mid-Continent Oil & Gas Association and the Independent Petroleum Association of America, API compiles and publishes data pertaining to the estimated cost of drilling oil wells, gas wells, and dry holes, by depth ranges for various areas of the United States.

The second part consists of an estimate of expenditures for oil and gas exploration, development, and production in the United States.

These data are published in what we call the joint association survey.

Now, there are no annual sources of cost and expenditure information comparable to that published in the joint association survey. However, the "Census of Mineral Industries" is now available every 5 years—previously at 4-year intervals. This provides benchmark data against which the results in the JAS can be compared for accuracy.

We have made a very careful study of the two documents for the years 1963 and 1967 and we are satisfied that we have come up with results that in our opinion are better than what Census has done.

The Federal Power Commission has also collected voluminous data of a similar nature. The Chase Manhattan Bank collects data and prepares estimates of total expenditures. The point is there are a lot of cross-checks to the data we are publishing.

The fourth area pertains to drilling statistics. Prior to 1966, the basic sources of statistics pertaining to the drilling of oil and gas wells were the trade journals. The States published drilling statistics, the American Association of Petroleum Geologists published drilling statistics. There were also commercial scouting associations. However, none of these agencies were covering the United States uniformly and they were not using standard definitions.

According to the Kruger report, the study I referred to a moment ago, there was no single, timely, uniform, accurate, and complete set of data. In response to that report the API worked out an arrangement with the American Association of Petroleum Geologists whereby we are getting a ticket filled out on each well drilled and completed in the United States. A copy comes to the API for tabulation. In the meanwhile a copy passes to the American Association of Petroleum Geologists Committee on Statistics of Drilling. They review this in the light of their professional judgment as to how the well is classified and their judgment prevails when the final tabulations are made.

Again there are sources of data against which these API publications can be cross-checked. The "Census of Mineral Industries" every 5 years, the trade journals still publish data. There are also scouting associations and commercial companies that collect a great deal of drilling information for the United States.

Now beyond these basic elements of the program, a major function of the API for the past 7 years has been to establish standard definitions which are crucially important to the development of useful and compatible statistical systems. I can say for certain that the Bureau of Mines definitions and API definitions are uniform. The definitions used by Census are uniform with respect to what the API uses. We also publish petroleum facts and figures in recognition of need for a compendium of all data pertaining to the petroleum industry. This is simply an encyclopedia.

On an annual basis we publish the annual statistical review, which is primarily a summarization of data published by the Bureau of Mines. The purpose is to put it in a more convenient reference form. Very soon we anticipate expanding the annual statistical review to include other series. In effect it will be come an annual supplement to "Petroleum Facts and Figures."

Mr. Chairman, this completes my statement but I would like to make several observations which I believe are related to these hearings.

First, contrary to certain opinions, there is a voluminous amount of data available with respect to the petroleum industry. The API statistical program provides only a small fraction of the total data available. I am fully in agreement with the panelist a moment ago who said we have so dang much of it it is hard to correlate; it needs organization; definitions are different. We have a problem.

Second, I am convinced that much of the current controversy concerning the availability and credibility of petroleum statistics stems from confusion as to the difference between statistics on the one hand and projections on the other. This is reflected in the confusion of the public as to the degree of the energy shortage. What the public really wants to know is what the situation will be next February, next March, what the situation will be in August, with respect to gasoline supplies. The real measure of the current adequacy of stocks of gasoline and fuel oil is not so much how they compare a year ago, but how they relate to an expected summer travel demand, whether in February and March, the level of refinery runs that will be possible to support demand in view of the embargo.

Statements about the future must be based on assumptions involving numerous variables such as these. When forecasters differ in their assumptions they may arrive at different conclusions.

Finally, the allegation has been made that the API gathers statistics solely for the benefit of its larger members: This is not the case.

All of the information the API collects is published in summary form. Our publications are distributed on a complimentary basis to all members of the press and government agencies without restrictions of any kind. Our publications are available to all others on a subscription basis regardless of whether the individual or the agency is a member of API.

Thank you.

Chairman PROXMIRE. Thank you, Mr. Hodges.

[The prepared statement, with exhibits, of Mr. Hodges follows:]

PREPARED STATEMENT OF JOHN E. HODGES

Mr. Chairman, I am John Hodges, Director of Statistics at the American Petroleum Institute. I joined the staff of the API in 1966. Prior to that time, I taught statistics and economics at three universities for a period of approximately twenty-five years. Concurrently, I accumulated twenty-three years of full-time industrial experience as statistician, economist, and vice president of a large oil well equipment manufacturer.

Since 1944, I have been continuously involved with problems pertaining to petroleum industry statistics. My work in private industry involved collection of primary petroleum data and the use of petroleum statistics for forecasting. My academic career (and personal interests) led to my involvement with the collection, analysis, and use of petroleum statistics, long before I became a member of the API staff.

Because of current interest in data pertaining to the petroleum industry, I welcome this opportunity to review the basic elements of the API statistical program.

The API was organized in 1919. From its inception, the API has been profoundly aware of the public's interest in the adequacy of petroleum supply.

In 1920, the API established a statistical department charged with responsibility for the collection and prompt publication of vital statistics pertaining to the petroleum industry.

The first efforts of the new department were directed toward the preparation of estimates of daily average crude oil production. From that beginning, the work of the department has been gradually expanded in well-defined but limited areas.

Before describing API statistical publications I wish to emphasize the API does not make or publish forecasts or projections of any kind, and it does not collect statistical information on prices.

The Weekly Statistical Bulletin.—The Weekly Statistical Bulletin in its present format is a direct outgrowth of the work that was started in 1920. This Bulletin provides data pertaining to the domestic petroleum industry such as weekly crude runs to crude oil distillation units, the utilization of operable refining capacity, weekly refinery production of gasoline, jet fuels, distillate fuel oil, and residual fuel oil. In addition, the Bulletin shows weekly stocks of crude oil and refined products, weekly estimates of domestic crude oil production, and weekly information pertaining to the imports of crude oil and refined products. Stocks (i.e., inventories) reported by the API and the Bureau of Mines are referred to as "primary stocks." These stocks are located at refineries, bulk terminals, and in pipelines. They do not include inventories in the hands of distributors and consumers, i.e., secondary stocks.

In recognition of the importance of the time factor, the Bulletin is usually published each Wednesday on the basis of information reported directly to the API by refiners and pipeline companies involved with supply and refinery operations. The information reported to the API each week reflects operations for a seven day period ending on the Friday preceding publication.

In order to put the Weekly Statistical Bulletin in proper perspective, it should be noted that the U.S. Bureau of Mines publishes monthly reports on the domestic supply system that are much more comprehensive than the API weekly reports. However, their monthly reports dealing with various aspects of supply, demands, movements of crude oil and products, refinery operations, and inventories, run at least two months behind in publication; e.g., as of today, the latest figures available are for the month of October. (This lag represents about the normal time required to collect and compile the voluminous statistics in the 24 tables in their "Monthly Petroleum Statement.") Nevertheless, the industry as well as the federal government, considers the Bureau of Mines to be the definitive source of information of the types reported in the Monthly Petroleum Statement.[1]

It should be emphasized, therefore, that the primary purpose of the API Weekly Statistical Bulletin is to provide the most timely information that can be collected covering selected operating series pending release of the definitive data from the Bureau of Mines.

The data published in the Bulletin are made possible by the voluntary cooperation of those members of the API willing to provide information pertaining to their operations. A comparison of volumes reported to the API with volumes reported to the Bureau of Mines for the first nine months of 1973 is shown in Exhibits A and B on a percentage basis.[2] For example, the volumes of crude runs *reported* to the API during the first nine months of 1973 averaged approximately 97 percent of volumes of crude runs reported to (and published by) the Bureau of Mines.

In order to publish estimates of total industry volumes reported in the Bulletin, the API has traditionally introduced an estimate of unreported volumes. These estimates are based on a comparison of the latest figures available from the Bureau of Mines with data actually reported to the API for the same period. In other words, we are currently using adjustment factors based on a comparison of Bureau of Mines data for the month os September, 1973 with data actually reported to the API for weeks ending in September 1973. API weekly estimates are audited regularly against Bureau of Mines reports as they become available. This enables us to detect deficiencies in our estimates and to make necessary adjustments in our estimating procedures. Comparisons of the reliability of data published by the API as related to data published by the Bureau of Mines are shown in Exhibits A and B. For example, with respect to crude runs, API data *published* for the first nine months of 1973 were within four tenths of one per cent of crude runs published by the Bureau of Mines.

Our agreement with the companies that cooperate in this statistical program is that we will use the data supplied to arrive at and publish estimates for the industry, and that the API will not release information pertaining to individual companies operations. This understanding reflects a basic view that release of data on the operations of a company is the proper function of that company and not of a trade association.

The accuracy of weekly API data can be verified for any given month by comparison with monthly results published by the Bureau of Mines. As shown in Exhibits A and B, the weekly averages have compared exceptionally well with final data published by the Department of the Interior. Furthermore, the major companies in the industry are called upon periodically to testify before the Texas Railroad Commission as to their inventories of crude oil and major products. Those statistics are a matter of public record available to everyone, and are frequently published in trade journals. They have not been considered of general public interest in the past when supplies were adequate to meet demands and only industry totals were of concern to business publications and newspapers.

In the present period of shortages, additional interest has developed in current statistics other than those published by the API. For example, questions are being raised as to the accumulation of secondary inventories outside the hands of major refiners and pipeline companies, and trends in the actual cur-

---

[1] Definitions of all terms used by the API are the same as those used by the Bureau of Mines.

[2] October results from the Bureau of Mines were not received in sufficient time to update Exhibits A and B.

rent consumption of fuels. The API does not collect data on inventories in the hands of distributors and consumers.[3] This would involve an extensive and elaborate reporting system in order to cover inventories existing in, for example, gasoline service stations, fuel oil tanks for home heating systems, etc. The task of collecting information from thousands of dealers, distributors, and consumers, who are not now faced with that burden, would be impossible for a trade association relying on voluntary cooperation.

It should also be noted that the API does not try to measure actual consumption of fuels on a weekly basis because it has no basis for estimating the changes in stocks held outside of primary storage.

Reserves Data.—The first organized effort by the API to develop an estimate of the country's over-all reserves of oil (as far as I have been able to determine) was made in 1935 by a Subcommittee on Known Reserves of the API's Special Committee on Production and Supply. This Committee's finding was that, as of January 1, 1935, domestic proved oil reserves were 12.17 billion barrels. Since that initial effort, the name of the committee has been revised several times to reflect the nature of its work more accurately, and its workload has been greatly expanded.

In 1965, a study entitled *Petroleum Statistics Report* was prepared by the Petroleum Statistics Study Group at the request of the Bureau of the Budget. (This group was comprised of members of the various agencies of the federal government including Commerce, Interior, Justice, the Council of Economic Advisers, Office of Emergency Planning, and the Federal Power Commission. Hereafter, the study prepared by this group will be referred to as the "Krueger Report.") The Krueger Report called for a substantial amount of additional information pertaining to crude oil reserves in the United States. Late in 1965 the Director of the Office of Oil & Gas was given focal responsibility for coordinating federal government requirements for petroleum statistics. Observers from the Office of Oil & Gas were present at meetings of the API Committee on Reserves & Productive Capacity where various reserves definitions and information requirements were discussed. As a result of these efforts, the API reserves report was expanded from approximately thirty pages to approximately two hundred and fifty pages. Since 1966, the Director of the Office of Oil & Gas has been serving as an observer on the API Committee on Reserves & Productive Capacity, and qualified government observers have been attending some of the subcommittee meetings for several years.

The API publishes annual estimates of proved reserves and productive capacity of crude oil, and collaborates with the American Gas Association in the preparation of estimates of proved reserves of natural gas liquids.

At this point it may be helpful to define the meaning of proved reserves as developed by the API Committee on Reserves and Productive Capacity. Proved reserves as of any given date are the estimated quantities of all liquids statistically defined as crude oil, which geological and engineering data demonstrate with reasonable certainty to be recoverable in future years from known reservoirs under existing economic and operating conditions (including technology at the time the estimate is made).

Reservoirs are considered proved if economic producibility is supported by either actual production or conclusive formation tests. The area of an oil reservoir considered proved includes: (1) that portion delineated by drilling and defined by gas-oil or oil-water contacts, if any; and (2) the immediately adjoining portions not yet drilled but which can be reasonably judged as economically productive on the basis of available geological and engineering data. In the absence of information on fluid contacts, the lowest known structural occurrence of hydrocarbons controls the lower proved limit of the reservoir.

Reserves of crude oil which can be produced economically through application of improved recovery techniques (such as fluid injection) are included in the "proved" classification when successful testing by a pilot project, or the operation of an installed program in the reservoir, provides support for the engineering analysis on which the project or program was based.

Estimates of proved crude oil reserves do not include the following: (1) oil that may become available from known reservoirs but is reported separately as "indicated additional reserves"; (2) natural gas liquids (including conden-

[3] The Bureau of Mines is presently collecting some inventory statistics for a selected number of independent terminal operators on the East Coast. This is, however, not a complete accounting. In addition, the Federal Power Commission collects statistics on one very important category of secondary stocks, i.e., those held by electric power companies. Their latest report contains data as of December 1972.

sate); (3) oil the recovery of which is subject to reasonable doubt because of uncertainty as to geology, reservoir characteristics, or economic factors; (4) oil that may occur in untested prospects; and (5) oil that may be recovered from oil shales, coal, gilsonite and other such sources.

The API has not developed a definition of "potential future reserves." However, it appears that this phrase is used in referring to the estimated volume of a resource in the ground that has not yet been discovered. Potential future reserves are sometimes designated as probable, possible, and speculative. Whether estimates so characterized will ever be discovered, and what the volumes will actually be, will depend upon the interplay of *future* economic, political, and technological factors. Such factors do not fall within the scope of the API reserves program.

For purposes of developing estimates of reserves, the United States is divided into fourteen geographic districts. A subcommittee is appointed for each district and charged with responsibility for the determination of reserves and productive capacity estimates in that district. The district subcommittees are made up of qualified technical personnel (professional engineers and geologists) from API member companies, having knowledge of the fields and reservoirs in their areas of responsibility.

Annual reports for each district are submitted by the subcommittee chairmen to the member of the main Committee on Reserves & Productive Capacity that has responsibility for the district. District totals are submitted to the Division of Statistics about March 1 of each year for tabulation by the API staff. About the middle of March the main committee meets for the purpose of reviewing year-end estimates prepared by the district subcommittees.

There is a common misconception that API reserves data are based on reports submitted by individual companies. In fact, estimates published by the API are prepared by highly qualified, professional personnel who prepare individual and independent estimates as to what proved reserves may be in the various areas.

An estimate prepared by an individual serving on a subcommittee may very well differ from the reserves data carried on the books of his company. Among other things, such differences may reflect the use of definitions by the various companies that differ from those used by the reserves committee and applied uniformly in all districts. Such differences may also occur because of different interpretations that may be placed upon complex geologic and reservoir data by qualified engineers.

The complexity of the physical behavior of oil, gas, and water within the producing reservoirs means that the preparation of estimates of reserves requires detailed study of changing reservoir performance by experts with very specialized training in engineering and geology. The estimates involve judgment as well as interpretation of available data, with the result that some variations can exist in the numbers calculated by different qualified experts.

Reserves estimates made in the early stages of development of a field may differ substantially from estimates made after further development has been completed.

Details of the organization of the Committee on Reserves & Productive Capacity and the definitions used for estimating proved reserves and productive capacity may be found in Exhibit C.

Drilling Costs and Expenditures Data.—In cooperation with the Mid-Continent Oil & Gas Association and the Independent Petroleum Association of America, the API collects and publishes data pertaining to (1) the estimated cost of drilling oil wells, gas wells, and dry holes, by depth range for major areas of the United States (referred to as Section I); and, (2) estimated expenditures for oil and gas exploration, development, and production in the United States (referred to as Section II). These data are published annually in the Joint Association Survey (JAS).

The first JAS, which was published in 1956, included data for the year 1953. In 1956, expenditure data for the years 1944 and 1948 were also published. The complete report was next published for the years 1955 and 1956. Beginning with the survey year 1959, the JAS has been published annually.

Since 1966, a number of improvements have been made in the JAS. However, the API has not been able to respond to recommendations that expenditure estimates be segregated by areas, and reported separately for oil and gas. The API has devoted considerable study to this problem and we have not yet found a satisfactory solution. A basic obstacle is the fact that companies do not keep

their records in this manner. There is also the theoretical problem of handling expenditures for products (crude oil and natural gas) which are explored for, developed, and produced jointly.

Data used in preparing the JAS are submitted directly to the API by companies. In 1972, Section I of the JAS was based on reported data covering 42 per cent of total wells and 50 per cent of total footage. Data in Section II were based on expenditures by companies having 79 per cent of total industry revenues from oil and gas production.

The data in Section 1 of the JAS are derived from a sample of wells, footage, and costs collected from operators of different sizes who drilled wells in various areas of the United States. The drilling costs reported are those incurred for drilling and equipping wells through the "Christmas tree" (that is, through the well-head equipment required to produce the well). The estimates of costs are derived by combining sample data with annual drilling statistics as compiled by the American Petroleum Institute and the American Association of Petroleum Geologists.

Section II provides annual information pertaining to expenditures incurred by operators incident to finding, developing, and producing oil and gas for the total U.S. However, the estimates for Section II do not include income taxes, interest charges on debt capital, and returns to investors. Expenditure estimates are based on regression analyses which correlate company size (measured by revenues reported to the JAS) and the various types of expenditures incident to the exploration, development, and production of oil and gas.

There are no annual sources of cost and expenditure information comparable to that which is published in the Joint Association Survey. However, the Census of Mineral Industries (which is now available every five years) provides bench mark data which can be compared to the JAS. We have made a careful analysis of both publications for the years 1963 and 1967 and we are satisfied that JAS results (with respect to costs and expenditures) compare favorably with the Census of Mineral Industries. The Federal Power Commission has also collected voluminous data of a similar nature. The Chase Manhattan Bank collects data and prepares estimates of total expenditures on an annual basis.

Drilling Statistics.—Prior to 1966, the basic sources of statistics pertaining to the drilling of oil and gas wells in the U.S. were the trade journals. Such data were also compiled by the various states and oil scout organizations. The American Association of Petroleum Geologists (AAPG) for many years had been compiling information on exploratory drilling. However, none of these agencies was covering the U.S. uniformly, and all were using different definitions. According to the Krueger Report, there was "no single, timely, uniform, accurate, and complete set of data."

In response to the Krueger Report, the API worked out an arrangement with the AAPG for the collection of drilling statistics for the U.S. on the basis of a uniform set of definitions which were developed with the participation of representatives from various government agencies that were interested in this problem.

Approximately three-fourths of the area of the United States has been divided into seventeen districts. Each district is assigned to an API respondent company that is especially qualified to collect and report drilling information for its area of responsibility. For the remainder of the U.S. (roughly the Northeast quadrant) nineteen states report drilling information directly to the API.

API respondents initiate an individual well ticket for each completed well. A copy of this ticket is transmitted to the API and used for compiling current statistics on a monthly and quarterly basis. A copy is also transmitted to the AAPG Committee on Statistics of Drilling (AAPG-CSD) which reviews all well classifications reported to the API and further classifies all exploratory wells in accordance with the guidelines originally developed by Dr. F. H. Lahee (Chairman of the AAPG Committee on Statistics of Drilling, 1945–1955) and applied by CSD members for more than twenty years. Annual drilling statistics published by the API are reported in accordance with CSD classifications.

Although the API-AAPG system is considered to be the most reliable source of drilling statistics, there are other sources of such information. For example: the Census of Mineral Industries, trade journals, oil scout associations, and commercial scouting companies.

Standard Definitions for Petroleum Statistics.—An important function of the API Division of Statistics has been to establish standard definitions which are of crucial importance to the development of useful and compatible statistical systems. For example, the API and the Bureau of Mines are using the same definitions in the area of supply and refinery operations. Definitions used in the Census of Mineral Industries are the same as those used by the API in connection with drilling statistics, costs, and expenditure data.

Petroleum Facts & Figures.—The first issue of Petroleum Facts & Figures was published by the API in 1928 in recognition of the need for a statistical compendium on the petroleum industry. Subsequent to that date, PF&F was published at roughly two-year intervals. As with most statistical publications this volume has grown in size. The 1971 edition included almost every important statistical series pertaining to the domestic petroleum industry and a number of tables pertaining to international operations.

This publication is considered to be a secondary source of information since almost every series in this volume is available from sources other than the API.

Annual Statistical Review.—Each year the API publishes the Annual Statistical Review which is a summarization of the most important Bureau of Mines Data pertaining to petroleum supply and refinery operations for the most recent years, and by months for the latest two years for which data are available. The purpose of the Annual Statistical Review is to provide a convenient reference to Bureau of Mines Data. The next edition will include additional data and, in effect, will become an annual supplement to Petroleum Facts & Figures.

Mr. Chairman, this completes my statement on work being done in the API Division of Statistics. A list of our publications is attached as Exhibit D. However, before concluding I would like to make several observations related to the purposes of this hearing.

1. Contrary to certain opinions there is a voluminous amount of data available with respect to the petroleum industry. The API statistical program provides only a small fraction of the total data reported and available to the public. There is considerable information published by various government agencies including the Department of Commerce, the Department of the Interior, Atomic Energy Commission, Federal Aviation Agency, Federal Power Commission, Department of Transportation, etc. All the data submitted to API are summarized and published with the exception of information that would in any way reveal individual company data. This is consistent with policies adopted by the Department of the Interior.

Despite the numerous sources of statistical information, many of the data published by these sources are not uniformly reported in accordance with standard definitions or a common statistical format. Nevertheless, these data can be useful in understanding the operation of the oil industry if an individual is willing to take the time to research and perform the necessary analytical work.

2. I am convinced that much of the current controversy concerning the availability and credibility of petroleum industry statistics stems from confusion as to the difference between statistics on the one hand, and projections on the other. This is reflected in the confusion of the public as to the degree of the energy shortage. What the public really wants to know is what the situation will be next February, next August, etc. Statements about the future are not necessarily simple extensions of the past. The real measure of the current adequacy of stocks of gasoline and fuel oil is not so much how they compare with a year ago but how they relate to expected summer travel demand, weather in February and March, and the level of refinery runs that will be possible this spring in view of the embargo. Statements about the future must be based on assumptions involving numerous variables such as these. When forecasters differ in their assumptions, they may arrive at different conclusions.

3. The allegation has been made that the API gathers statistics solely for the benefit of its larger members. This is not the case. All of the information that the API collects is published in summary form. Our publications are distributed on a complimentary basis to all members of the press and governmental agencies without restriction of any kind. Our publications are available to all others on a subscription basis regardless of whether the individual or agency is a member of the API.

PER CENT REPORTED TO API vs. BUREAU OF MINES – TOTAL U.S.

1973	REFINERY PRODUCTION								IMPORTS	
	Crude Runs	Motor Gasoline	Naph. Jet	Kero. Jet	Distillate Fuel Oil	Residual Fuel Oil	Avia, Gasoline	Kerosine	Crude Oil	Refined Products
Jan.	96.4	95.3	73.3	100.2	97.1	98.2	127.1	102.3	92.8	57.1
Feb.	96.0	96.0	70.9	95.3	96.9	97.0	141.9	105.4	86.6	54.5
Mar.	96.6	96.1	83.3	99.3	97.4	98.9	115.1	115.2	88.7	56.4
Apr.	96.3	96.9	70.1	98.6	97.5	101.2	104.5	109.8	96.4	65.1
May	97.0	96.6	68.2	99.6	98.8	97.5	109.4	134.7	92.3	51.5
June	96.5	97.1	69.9	102.8	95.0	94.8	107.9	109.6	93.8	52.2
July	96.9	96.5	76.6	99.3	97.2	96.9	107.1	132.8	90.5	51.2
Aug.	98.3	97.3	66.4	97.7	96.2	93.5	102.1	141.5	98.4	48.3
Sep.	96.8	96.1	71.0	101.1	94.4	94.6	123.6	119.4	95.1	61.8
High	98.3	97.3	83.3	102.8	98.8	101.2	141.9	141.5	98.4	65.1
9 Mos. Avg.	96.8	96.4	72.2	99.3	96.7	97.0	115.4	119.0	92.7	55.3
Low	96.0	95.3	66.4	95.3	94.4	93.5	102.1	102.3	86.6	48.3

PER CENT API PUBLISHED vs. BUREAU OF MINES – TOTAL U.S.

1973										
Jan.	99.7	98.0	107.9	102.4	98.7	95.1	85.6	91.2	97.0	102.5
Feb.	99.6	98.9	106.1	98.3	98.7	95.2	122.3	94.3	92.4	96.0
Mar.	100.0	99.4	112.2	101.3	99.4	99.0	87.1	102.3	95.7	97.6
Apr.	100.1	100.3	98.5	100.9	99.5	101.6	81.1	95.1	104.3	114.3
May	100.6	99.7	98.3	102.7	101.0	97.5	86.9	115.2	100.5	97.3
June	100.4	99.9	97.9	105.9	97.7	95.9	94.6	97.7	103.8	95.6
July	100.7	99.4	105.3	101.9	99.9	98.6	97.1	114.8	99.6	92.0
Aug.	102.2	100.5	93.5	99.7	99.8	93.4	90.2	130.0	104.4	87.3
Sep.	100.7	99.4	95.9	102.3	97.0	95.2	104.1	107.5	101.7	104.7
High	102.2	100.5	112.2	105.9	101.0	101.6	122.3	130.0	104.4	114.3
9 Mos. Avg.	100.4	99.5	101.7	101.7	99.1	96.8	94.3	105.4	99.9	98.6
Low	99.6	98.0	93.5	98.3	97.0	93.4	81.1	91.2	92.4	87.3

Division of Statistics
American Petroleum Institute

EXHIBIT A

PER CENT STOCKS REPORTED TO API vs. BUREAU OF MINES – TOTAL U.S.

1973	Motor Gasoline	Naph. Jet	Kero. Jet	Distillate Fuel Oil	Residual Fuel Oil	Avia. Gasoline	Kerosine	Unfinished Oils	Crude Oil
Jan.	94.7	87.0	97.9	95.0	77.1	110.7	93.7	96.3	85.4
Feb.	95.8	83.2	94.9	97.0	80.6	96.6	97.0	96.9	86.1
Mar.	97.1	84.1	93.6	94.3	82.1	99.6	99.4	97.0	85.9
Apr.	94.5	92.3	92.4	92.2	78.5	95.2	96.7	97.1	86.3
May	95.8	88.3	96.8	95.7	75.7	92.5	99.6	96.1	87.1
June	94.5	90.4	95.2	95.1	74.3	96.3	97.9	97.7	88.2
July	92.8	83.9	89.0	95.6	75.4	82.7	96.6	97.3	86.9
Aug.	94.4	84.4	92.9	94.2	75.9	89.8	94.1	98.3	87.4
Sep.	93.4	91.0	89.9	94.8	72.4	94.4	93.9	94.4	88.2
High	97.1	92.3	97.9	97.0	82.1	110.7	99.6	98.3	88.2
9 Mos. Avg.	94.8	87.2	93.6	94.9	77.3	95.3	96.5	96.8	86.8
Low	92.8	83.2	89.0	92.2	72.4	82.7	93.7	94.4	85.4

PER CENT STOCKS API PUBLISHED vs. BUREAU OF MINES – TOTAL U.S.

1973									
Jan.	98.8	99.4	103.0	101.5	101.5	116.3	100.2	100.5	99.2
Feb.	100.5	95.5	98.9	102.9	104.7	102.5	104.6	100.8	100.3
Mar.	101.9	95.8	97.0	98.8	101.9	105.7	106.0	100.6	99.8
Apr.	99.2	104.9	96.2	97.4	97.0	101.4	102.1	100.7	100.2
May	100.2	101.4	101.3	102.1	96.3	98.7	104.4	99.8	100.4
June	98.4	105.1	99.4	101.8	97.0	102.5	102.3	101.7	101.7
July	96.5	99.9	93.1	102.1	98.8	88.0	100.6	101.4	100.8
Aug.	98.0	100.7	97.1	100.3	102.2	95.4	98.0	102.4	101.2
Sep.	97.1	106.0	93.3	100.6	101.3	98.9	97.8	98.4	102.2
High	101.9	106.0	103.0	102.9	104.7	116.3	106.0	102.4	102.2
9 Mos. Avg.	99.0	101.0	97.7	100.8	100.1	101.0	101.8	100.7	100.6
Low	96.5	95.5	93.1	97.4	96.3	88.0	97.8	98.4	99.2

Division of Statistics
American Petroleum Institute

EXHIBIT B

Exhibit C

TECHNICAL REPORT NO. 2

DIVISION OF STATISTICS • AMERICAN PETROLEUM INSTITUTE
1101 SEVENTEENTH STREET N. W. • WASHINGTON, D. C. 20036

ORGANIZATION and DEFINITIONS for the ESTIMATION of RESERVES and PRODUCTIVE CAPACITY of CRUDE OIL

PREFACE

This is the second of a series of Technical Reports published by the American Petroleum Institute which provide information concerning definitions, organization, procedures, and methodology used in compiling petroleum industry statistics.

Technical Report No. 2 is specifically concerned with (1) the definitions used by the API Committee on Reserves and Productive Capacity, and (2) the organization responsible for the compilation of estimates of proved reserves of crude oil, productive capacity, and related information.

The petroleum industry and the general public have long been alert to the need for information pertaining to reserves of crude oil and natural gas. In 1915, Ralph Arnold prepared an estimate of crude oil reserves. Similar estimates were prepared by the U. S. Geological Survey in 1916 and 1919. For the year 1922, estimates of crude oil reserves were prepared jointly by the U. S. Geological Survey and the American Association of Petroleum Geologists. Estimates of crude reserves were prepared by the American Petroleum Institute in 1925, and estimates for 1927 and 1933 were made by the Federal Oil Conservation Board.

The petroleum reserves of the United States have been systematically reviewed and reported on an annual basis by industry technical groups since 1936. Initially, the estimations were made by the Committee on Petroleum Reserves of the American Petroleum Institute, and were limited to reserves of crude oil, including lease condensate.

The Committee on Natural Gas Reserves was formed by the American Gas Association in 1946 for the purpose of preparing annual estimates of reserves of natural gas and natural gas liquids. Since that date, the API and A.G.A. committees have worked cooperatively to insure that all liquid hydrocarbon reserves are properly classified and reported.

In 1966, the API Committee's name was changed to the "Committee on Reserves and Productive Capacity." In addition to continuing its work with respect to proved reserves, the Committee's responsibilities were expanded to include the development of supplementary data including the following:

1. Original oil-in-place and ultimate recovery categorized by:
   a. Geologic age of reservoir rock
   b. Reservoir lithology
   c. Type of entrapment
2. Indicated additional reserves resulting from the future application of known improved recovery techniques in known fields.
3. Allocations back to year of discovery of:
   a. Current estimates of ultimate recovery
   b. Current estimates of original oil-in-place
4. Reserves and production data by subdivisions for the states of California, Louisiana, New Mexico, and Texas.
5. Crude oil productive capacity by states and by subdivisions for the states of California, Louisiana, New Mexico, and Texas.

This report is intended primarily as a handbook for the engineers and geologists who actually prepare the detailed estimates that are aggregated and published by the American Petroleum Institute. It is anticipated that this report will also be helpful and informative to those interested in using data pertaining to U. S. crude oil reserves and productive capacity.

Washington, D. C.
June 30, 1970

TABLE OF CONTENTS

Page

PREFACE iii

SECTION A. ORGANIZATION

Introduction 1
Responsibilities of the Committee on Reserves & Productive Capacity. 2
Authority 2
Membership 3
Role of Chairman 3
Organization of the Committee 4
Steering Subcommittee 4
Subcommittee on Certificates of Appreciation 4
Subcommittee on the Annual Report 4
District Subcommittees 4
Coordination with American Gas Association Committee on Natural Gas Reserves 6
Records and Reports of District Subcommittees 7
Confidentiality of Information 7
Meetings 8
The Annual Report 9
API Certificates of Appreciation 9

SECTION B. DEFINITIONS

Crude Oil 10
Production 11
Cumulative Production 12
Proved Reserves of Crude Oil 12
Proved Developed Reserves 13
Proved Undeveloped Reserves 14
Indicated Additional Reserves 14
Discoveries 15
Graphic Illustrations 16
Extensions 17
Revisions 17
Proved Acreage 18
Improved Recovery Techniques 18
Original Oil-In-Place 19
Ultimate Recovery 20
Productive Capacity of Crude Oil 20

Page

SECTION C. GEOLOGICAL INFORMATION ON OIL OCCURRENCE

Introduction 24
Oil by Age of Reservoir Rock 24
Oil by Reservoir Lithology 25
Oil by Type of Entrapment 26

SECTION D. GEOGRAPHIC BOUNDARIES 27

APPENDIX A. Organization of API Statistical Services 29

APPENDIX B.

Map I – Geographic Districts of the United States covered by API Reserves Subcommittees 32
Map II – Subdivisions of California used in reporting reserves data 33
Map III – Subdivisions of Louisiana used in reporting reserves data 34
Map IV – Subdivisions of New Mexico used in reporting reserves data 35
Map V – Subdivisions of Texas used in reporting reserves data 36

APPENDIX C.

Figure 1 New Field Discovery 38
Figure 2 New Field Discovery in Area of Additional Well Control 39
Figure 2–A Cross-Section of Structure in Figure 2 39
Figure 3 New Field Discovery 40
Figure 3–A New Field Discovery 40
Figure 3–B New Field Discovery 41
Figure 4 Cross-Section of Field Discovery 42

APPENDIX D.

Arithmetic Relationships Applicable to Tables Published in Annual Reports 44

SECTION A. ORGANIZATION

INTRODUCTION

The statistical program of the American Petroleum Institute is conducted in accordance with the Statement of Policy on Petroleum Statistics which reads as follows:

> *The American Petroleum Institute assumes a leadership role on behalf of the petroleum industry to insure that adequate statistical reporting of its operations is achieved on a timely basis. Close liaison is maintained with governmental and trade and professional organizations with regard to the collection and dissemination of statistical data on the petroleum industry. The Institute actively cooperates with other groups with the objective of improving the report coverage of the industry. By doing so it seeks to avoid the collection of statistical data already being compiled by others. Statistical information is published under Institute sponsorship in the maximum degree of detail consistent with the safeguarding of proprietary information of individual companies, while mindful of the cost and utility of the data involved. The Institute's statistics are confined to current and historical data. The Institute does not participate in the publication of forecasts of future demand for petroleum or its products, nor of estimates of crude oil, natural gas, or natural gas liquid recoveries that are speculative in nature or that rely upon conjecture regarding future physical or economic conditions.*

This policy is implemented by an organization of five standing committees as follows:

1. Committee on Well and Drilling Statistics
2. Committee on Reserves and Productive Capacity
3. Committee on Expenditures and Revenues
4. Committee on Supply and Consumption Statistics
5. Committee on Marketing Statistics

Each of these committees operates under the general direction of the API Committee on Statistics. (See Organization of API Statistical Services, Appendix A.)

RESPONSIBILITIES OF THE COMMITTEE ON RESERVES & PRODUCTIVE CAPACITY*

The primary function of the Committee on Reserves and Productive Capacity is to develop and report estimates of reserves and productive capacity of crude oil in the United States. In addition, the Committee has the following general responsibilities:

1. Continually assess existing reserves and productive capacity data regarding reliability, usefulness, and timeliness.

2. Recommend the development of additional series which will eliminate data gaps and provide adequate coverage of reserves and productive capacity.

3. Recommend revisions of reserves and productive capacity series which are not accurate and timely.

4. Recommend elimination of series which do not provide worthwhile information.

5. Seek means of reducing the cost of providing data without jeopardizing accuracy or timeliness.

AUTHORITY

The Committee has authority to initiate whatever actions or studies are necessary in the discharge of its responsibilities. It may approve changes in existing statistical series which will improve their reliability, usefulness, and timeliness.

Extensions to existing statistical series, the creation of new series, and the elimination of existing statistical series require approval of the Committee on Statistics. Recommendations for such changes are submitted to the Committee on Statistics through the Statistics Coordinating Committee.

---

*This committee replaces the former API Committee on Petroleum Reserves which developed and reported annual reserve estimates from 1936 through 1965.

The professional judgment of the Committee members, as reflected in the development of estimates of crude oil reserves and productive capacity, is recognized and preserved without modification by higher authority or other committees within the Institute.

MEMBERSHIP

Members of the Committee on Reserves and Productive Capacity and its Chairman are appointed by the Chairman of the Committee on Statistics. Initial appointments are made for a period of two years and appointments are generally renewed on a year-to-year basis as long as members retain an active affiliation with the petroleum industry in a capacity which enables them to contribute to the work of the Committee. The Director of the API Division of Statistics serves as Secretary of the Committee.

The Committee is composed of individuals who are professionally competent in the committee's area of responsibility. These individuals are selected from the management of the petroleum industry, industry-associated companies, and independent agencies. Normally, no more than one representative from each company (including its subsidiaries) or agency will serve on the Committee at the same time.

The Federal Government is represented on the Committee by a designated observer.

ROLE OF CHAIRMAN

The Chairman of the Committee is responsible for insuring that the work of the Committee is performed in an expeditious and timely manner. The Chairman calls meetings, appoints subcommittees of the main Committee and their chairmen, appoints special task groups, and makes such assignments as may be necessary to perform the work of the Committee. He reports the results of the Committee's work to the Committee on Statistics through the Statistics Coordinating Committee.

ORGANIZATION OF THE COMMITTEE

The Chairman of the Committee assigns to each member (except the Secretary) responsibility for the development of data pertaining to reserves and productive capacity for a specific area of the U. S. In carrying out this responsibility, committee members may appoint one or more subcommittees made up of qualified technical personnel that are responsible for the development of estimates for specific districts. These subcommittees, which are responsible for determining annual reserves and productive capacity estimates, are composed of geologists and engineers who (1) represent various segments of the producing industry having prominent ownership holdings in the subcommittee's assigned area; (2) have broad experience in the estimation of reserves and productive capacity; and (3) have an intimate knowledge of the areas and the more significant sized fields assigned to them. The subcommittees are expected to make multiple assignments of selected fields to their members where it will beneficially contribute to the quality of reserve and productive capacity estimates and promote the exchange of expert views important thereto.

The Chairman of the Committee on Reserves and Productive Capacity appoints standing subcommittees from the membership of the main committee as follows:

1. Steering Subcommittee. This subcommittee is concerned with the development of definitions, guidelines, procedures, etc., which will assist in the determination and compilation of data required by the Committee.
2. Subcommittee on Certificates of Appreciation. This subcommittee recommends members of district subcommittees that are eligible to receive certificates of appreciation for services rendered. The Subcommittee on Certificates of Appreciation also recommends members of the main committee that deserve special recognition for outstanding service.
3. Subcommittee on the Annual Report. This subcommittee oversees the preparation of the annual report giving special consideration to the wording of the text, organization and format of tables, etc.

DISTRICT SUBCOMMITTEES

Members of the district subcommittees are appointed for a period of one year, but membership is usually retained as long as responsibilities are properly discharged and the policies of the main Committee are observed. However, each member is expected to serve only as long as he retains an active affiliation with the petroleum industry in a capacity which enables him to contribute to the work of a subcommittee.

5.

The geographic districts of the United States assigned to members of the Committee on Reserves and Productive Capacity and their respective subcommittee organizations are as follows (see maps in Appendix B):

1. Northeastern District Subcommittee.
   a. Tennessee
   b. Ohio
   c. West Virginia
   d. Virginia
   e. New York, Pennsylvania, and other northeastern states.
2. Southeastern District Subcommittee. (Arkansas, North Louisiana, Mississippi, Alabama, Florida, Georgia, South Carolina, and North Carolina.)
3. South Louisiana District Subcommittee.
4. North Central District Subcommittee.
   a. Illinois, Indiana, and Kentucky
   b. Michigan
5. Central District Subcommittee. (Oklahoma, Kansas, and Missouri.)
6. Texas Gulf Coast District Subcommittees.
   a. Texas Railroad Commission Districts 1 and 2
   b. Texas Railroad Commission District 3
   c. Texas Railroad Commission District 4
7. East Texas District Subcommittee. (Texas Railroad Commission Districts 5 and 6.)
8. North Texas District Subcommittees.
   a. Texas Railroad Commission District 7B
   b. Texas Railroad Commission District 9
   c. Texas Railroad Commission District 10
9. Southeast New Mexico and West Central Texas District Subcommittee. (Southeast New Mexico and Texas Railroad Commission District 7C.)
10. West Texas District Subcommittee. (Texas Railroad Commission Districts 8 and 8A.)
11. South Rocky Mountain District Subcommittees.
    a. Eastern Colorado and Nebraska
    b. Western Colorado, Utah, and Northwest New Mexico

12. North Rocky Mountain District Subcommittee.
    a. North Dakota, South Dakota, and Montana
    b. Wyoming and Idaho
13. Pacific Coast District Subcommittee. (Arizona, California, Nevada, Oregon, and Washington)
14. Alaska District Subcommittee.

The member of the main Committee having responsibility for a given area is expected to assure himself that each Subcommittee under his jurisdiction is adequately staffed with competent personnel and that the work is performed in accordance with the guidelines, procedures, and rules of the Committee on Reserves and Productive Capacity. The District Subcommittees bear the primary responsibility for the determination of estimates of reserves and productive capacity. In discharging these responsibilities within the Subcommittees a special effort is made to assign the more significant sized fields to individual members who are knowledgeable thereof either directly or through their affiliations. Additionally, the Subcommittees are expected to make multiple assignments of selected fields to their members where it will beneficially contribute to the quality of reserve and productive capacity estimates and promote the exchange of expert views important thereto.

COORDINATION WITH AMERICAN GAS ASSOCIATION COMMITTEE ON NATURAL GAS RESERVES

Reserves and production of associated–dissolved gas are directly related to the reserves and production of crude oil. Therefore, since the A.G.A. Committee on Natural Gas Reserves develops estimates of reserves and productive capacity of natural gas and natural gas liquids, close cooperation between the A.G.A. and the API subcommittees is required.

Each API subcommittee designates one of its members to work with the appropriate A.G.A. subcommittee in order to assure that all necessary information is available for the determination of reserves and productive capacity of associated–dissolved gas. Information supplied to A.G.A. subcommittees by the API is limited to that which is required for specific applications, and such information is held confidential by the A.G.A.

Coordination between A.G.A. and API subcommittees is also necessary in order to avoid the omission or duplication of certain field statistics where the distinction between crude oil and natural gas liquids requires specific interpretation. Such cooperation insures that various types of hydrocarbon reserves in the United States are reported by the appropriate committee.

RECORDS AND REPORTS OF DISTRICT SUBCOMMITTEES

District subcommittee records are maintained for individual reservoirs or fields as required to support information reported to the main Committee. These records are kept by chairmen of the subcommittees during their tenure and transferred to new chairmen at the time of their appointment.

Subcommittee chairmen are also responsible for maintaining statistics on depleted or currently abandoned fields even though such fields have no remaining reserves or productive capacity. These data are necessary to maintain a complete history of discoveries, cumulative production, and other statistics.

Annual reports for each district are submitted by subcommittee chairmen on designated dates (on forms provided by the API Division of Statistics) to the member of the main Committee responsible for the area. Copies are also submitted to the API Division of Statistics for summarization. Subcommittee chairmen are responsible for the content and accuracy of their respective reports. Prior to release, each table is checked for accuracy and internal consistency according to the relationships shown in Appendix D.

CONFIDENTIALITY OF INFORMATION

Records of the Committee on Reserves and Productive Capacity and its subcommittees are maintained strictly in accordance with the following policy:

> *It is essential to the success and integrity of the statistical program that members of the Committee and subcommittees adhere to the long-established policy of the former Committee on Petroleum Reserves by maintaining in strictest confidence the basic data and reserve estimates for individual fields used in the preparation of totals. No member of the Committee or its subcommittees is authorized to release any reserve or productive capacity information beyond that which is published in API reports on reserves and productive capacity.*

Each member of the Committee and its subcommittees is informed of this policy and his responsibility for its observance. Any information as to a possible violation of this policy should be reported to the Chairman of the Committee on Reserves and Productive Capacity.

MEETINGS

The Committee meets annually and more often if deemed necessary. The annual meeting is usually held in March for the primary purpose of reviewing and approving year-end estimates of reserves and productive capacity prepared by the district subcommittees. Subcommittees meet as often as required for the accomplishment of their assignments.

Subcommittee members are encouraged to attend the annual meetings in order to become better informed as to the overall operation of the Committee, its policies, and responsibilities.

Meetings are held at locations convenient to as many members as possible and distributed between the following geographical locations: east of the Mississippi River; west of the Mississippi River and east of the Continental Divide; and west of the Continental Divide. In preparation for each meeting, members are given adequate opportunity to suggest items to be included on the agenda.

The annual meeting is held at the same time and place as the meeting of the American Gas Association Committee on Natural Gas Reserves. Representatives of the Canadian Petroleum Association's Central Reserves Committee attend the annual meetings of the API Committee on Reserves and Productive Capacity and report changes in the status of Canadian reserves.

Each year, prior to the annual March meeting of the Committee, Committee members and subcommittee chairmen responsible for the various areas of Texas meet to review data for Texas which are to be submitted to the Committee. The Chairman of the Committee on Reserves and Productive Capacity schedules and presides over this meeting which is held in Houston, Texas.

THE ANNUAL REPORT

Reserves estimates and related statistics, as compiled and approved by the API Committee on Reserves and Productive Capacity, the A.G.G. Committee on Natural Gas Reserves, and the Central Reserves Committee of the Canadian Petroleum Association, are published annually.

Estimates of the productive capacity of crude oil, natural gas, and natural gas liquids in the U.S. were included in the annual reports for 1967 and 1968 and will be published in the future at intervals to be determined by the API and the A.G.A.

Following the annual meetings of the API and A.G.A. Committees, summary data for the United States are released to the press together with appropriate explanatory text. The complete annual report is available for distribution about June 1 of each year.

API CERTIFICATES OF APPRECIATION

Members of subcommittees are eligible for certificates of appreciation in accordance with the following rules:

1. An individual is eligible for a Certificate of Appreciation when he has served as chairman of a district subcommittee for a period of five years before completing a total of ten years of service. He will also be eligible for a certificate when he has completed a total of ten years, fifteen years, twenty years, etc., representing a combination of service as a member or chairman of a subcommittee.

2. An individual serving only as a member of a subcommittee will be eligible for his first award at the end of ten years of service. He will also be eligible for an award at the end of fifteen years of service, twenty years, etc.

3. An individual who has not served a minimum of five years as a subcommittee chairman, but has served a combination of ten years as a member of a subcommittee and as the chairman of a subcommittee will be eligible for an award at the end of ten years. Thereafter he will be eligible for an award at the end of fifteen years, twenty years, etc., for any combination of service.

4. In any given situation, years of service do not have to be consecutive and the individual does not have to serve on the same subcommittee continuously. However, service on two or more subcommittees in the same year is counted as one year of service.

Service as an alternate to a subcommittee member does not satisfy the conditions of eligibility set forth above; furthermore, the names of alternates are not listed with subcommittee members in annual reports.

SECTION B. DEFINITIONS

CRUDE OIL

DEFINITION

Crude oil is technically defined as a mixture of hydrocarbons that exists in the liquid phase in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities. For statistical purposes, volumes reported as crude oil include:

1. Liquids technically defined as crude oil;
2. Small amounts of hydrocarbons that exist in the gaseous phase in natural underground reservoirs but are liquid at atmospheric pressure after being recovered from oil well (casinghead) gas in lease separators;* and
3. Small amounts of nonhydrocarbons produced with the oil.

Statistical data pertaining to crude oil production, reserves, and productive capacity are reported as liquid equivalents at the surface (excluding basic sediment and water) measured in terms of stock tank barrels of 42 U. S. gallons at atmospheric pressure, and corrected to 60° F.

---

*From a technical standpoint, these liquids are termed "condensate"; however, they are commingled with the crude stream and it is not practical to measure and report their volume separately. All other liquids recovered from natural gas (including lease condensate) are included in natural gas liquid volumes reported by the A.G.A. (See American Petroleum Institute Technical Report No. 1, *"Standard Definitions for Petroleum Statistics,"* First Edition, July 1, 1969, pp. 16 and 17.)

The distinction between "condensate" which is statistically reported as crude oil, and condensate reported as natural gas liquids, is based on the type of well (oil or gas as generally classified by a regulatory agency) from which the condensate is produced. However, it should be understood that in the case of multiple completion wells (see p. 24 of Technical Report No. 1), the "condensate" that is reported as crude oil is the liquid recovered from casinghead gas produced from oil completions.

In most cases, the distinction between an "oil" completion and a "gas" completion is based on classifications by a regulatory agency and these classifications are used for statistical purposes wherever they are available. These classifications may be changed from time to time during the life of a reservoir and they may not be the same as the classifications assigned to wells when production equipment was first installed (see COMPLETION DATE, p. 23 of Technical Report No. 1).

In the absence of a regulatory authority, production data are reported on the basis of classifications made by the operator.

PRODUCTION

DEFINITION

Crude oil production is the volume of liquids statistically defined as crude oil, which is produced from oil reservoirs during given periods of time. The amount of such production for a given year is generally established by measurement of volumes delivered from lease storage tanks (i.e., the point of custody transfer) to pipelines, trucks, or other media for transport to refineries or terminals with adjustments for (1) net differences between opening and closing lease inventories, and (2) basic sediment and water (BS&W).

For purposes of the annual reserves reports, the subcommittees need production data for individual fields and for the specific geographic areas for which they are responsible. Since "official" sources such as state agencies and the U. S. Bureau of Mines do not provide the required detail, the subcommittees must analyze all available data (including company records, commercial services, state records, and Bureau of Mines reports) and make such adjustments as may be necessary to develop production series which satisfy their particular requirements. Because of differences in definitions and differences in data collection procedures used by various sources, and because of the variety of adjustments which must be made, production data used in annual reserves reports should not be expected to agree precisely with that published by sources such as state agencies and the U. S. Bureau of Mines.*

In addition to the problems outlined above, it should be noted that when reserve estimates are prepared for a current year, the subcommittees only have access to actual production data for the first nine or ten months of that year. Consequently, production totals

*It should be noted that the differences between the final production data used by the Committee on Reserves and Productive Capacity and "official" sources are small. For example, total U. S. production for 1966 shown in Table III of the report for 1967, is 99.96% of the total of all production reported by state agencies, and 94.9% of the total U. S. production reported by the U. S. Bureau of Mines. The larger difference between Table III and the Bureau of Mines reflects the inclusion of lease condensate in the Bureau of Mines figure. Beginning in 1969 the Bureau of Mines reports lease condensate as a separate production item.

reported for the current year in an annual report are preliminary estimates prepared by the subcommittees on the basis of incomplete information. However, by the time each annual report is prepared, the subcommittees have access to the "actual" total production for the preceding year and the figures shown in Table III are revised accordingly.*

CUMULATIVE PRODUCTION

DEFINITION

The sum of the estimated crude oil production for the current year and the actual production for each of the prior years is the cumulative production reported by the Committee.

PROVED RESERVES OF CRUDE OIL

DEFINITION

Proved reserves of crude oil as of December 31 of any given year are the estimated quantities of all liquids statistically defined as crude oil, which geological and engineering data demonstrate with reasonable certainty to be recoverable in future years from known reservoirs under existing economic and operating conditions.

Reservoirs are considered proved if economic producibility is supported by either actual production or conclusive formation tests. The area of an oil reservoir considered proved includes: (1) that portion delineated by drilling and defined by gas-oil or oil-water contacts, if any; and (2) the immediately adjoining portions not yet drilled but which can be reasonably judged as economically productive on the basis of available geological and engineering data. In the absence of information on fluid contacts, the lowest known structural occurrence of hydrocarbons controls the lower proved limit of the reservoir.

---

*The difference between the preliminary estimate for any given year and the actual production for that year, as subsequently determined by the subcommittees, is treated as a "revision" in Table I of the following year's report. It should be noted that the original annual estimates of production used in Table II are not revised since this would disturb the internal balance and consistency of the reserve estimates.

Reserves of crude oil which can be produced economically through application of improved recovery techniques (such as fluid injection) are included in the "proved" classification if successful testing by a pilot project, or the operation of an installed program in the reservoir, provide support for the engineering analysis on which the project or program was based.

Estimates of proved crude oil reserves do not include the following: (1) oil that may become available from known reservoirs but is reported separately as "indicated additional reserves"; (2) natural gas liquids (including lease condensate); (3) oil the recovery of which is subject to reasonable doubt because of uncertainty as to geology, reservoir characteristics, or economic factors; (4) oil that may occur in untested prospects; and (5) oil that may be recovered from oil shales, coal, gilsonite, and other such sources.

COMMENTS

At the close of each year, estimates of proved reserves are made for each new pool and new field discovery. In addition, previous estimates of proved reserves for fields and/or reservoirs discovered prior to the current year are reviewed and adjusted for (1) changes in proved areas; (2) revisions in recovery estimates based on better defined performance of the reservoirs or other geologic and engineering factors; and (3) the effect of the current year's production.

PROVED DEVELOPED RESERVES

DEFINITION

Proved developed reserves as of December 31 of any given year are proved reserves estimated to be recoverable through existing wells. Reserves in proved reservoirs penetrated by wells but currently not being produced are classified as "developed" if it is anticipated that such reserves will be recovered through existing wells requiring no more than workover operations.

PROVED UNDEVELOPED RESERVES

DEFINITION

Proved undeveloped reserves as of December 31 of any given year are defined as economically recoverable reserves estimated to exist in proved reservoirs which will be recovered from wells to be drilled in the future. Reserves in undrilled areas are included in proved reserve estimates if they are considered proved by geologic analysis of the current well information.

INDICATED ADDITIONAL RESERVES

DEFINITION

With the present state of industry technology, certain quantities of crude oil (other than those defined and reported as proved reserves) may be conomically recoverable from the following potential sources:

> Known productive reservoirs in existing fields expected to respond to improved recovery techniques such as fluid injection where (a) an improved recovery technique has been installed but its effect cannot yet be fully evaluated; or (b) an improved technique has not been installed but knowledge of reservoir characteristics and the results of a known technique installed in a similar situation are available for use in the estimating procedure.

Crude oil potentially available from these sources is reported as "indicated additional reserves." The economic recoverability of these reserves is not considered to be established with sufficient conclusiveness to allow them to be included in proved reserves; however, if and when improved recovery techniques are successfully applied to known reservoirs, the corresponding indicated additional reserves will be reclassified and added to the inventory of "proved" reserves.

Indicated additional reserves do not include reserves associated with acreage that may be added to the area of a proved reservoir as the result of future drilling.

15.

DISCOVERIES

DEFINITION

Discoveries reported as of December 31 for any given year are proved reserves credited to new fields and new pools in old fields as the result of successful exploratory drilling and associated development drilling during the current year.*

COMMENTS

The reliability of estimates of the proved productive area of new discoveries or partially developed reservoirs varies in relation to the amount of geological information available at the time the estimate is prepared. Important factors such as the areal extent of the structure, the average thickness of the producing reservoir, the oil column within the reservoir, and the continuity and characteristics of the reservoir formation cannot be determined accurately unless sufficient subsurface information is available.

The ultimate size of newly discovered reservoirs, whether in new fields or old fields, is seldom determined in the year of discovery. Therefore, first-year estimates of proved reserves in new reservoirs are often only a small part of the total that will be ultimately assigned to the new reservoirs. It follows that reserves credited to discoveries in any given year are usually less than total extensions and revisions for the same year which represent adjustments of reserves in reservoirs discovered in all prior years.**

---

*For definitions of field, pool, development drilling, exploratory drilling, etc., see Technical Report No. 1, pages 18, 26, and 27.

**Subcommittees are not necessarily aware of all new discoveries at the time reserve estimates are prepared. This is especially true if a discovery is made late in the year for which a report is being prepared. In such cases, new proved reserves are reported in Table I as discoveries in new fields or new pools in old fields for the year in which the discovery becomes known. In Table III these reserves are assigned to the year in which the field was actually discovered. The classification of discoveries as "new field" discoveries and "new pool" discoveries is based on the final classification of wells drilled. Well classifications are defined in Technical Report No. 1, Part II.

Current-year estimates of discoveries in new fields and new pools in old fields are reported in Table I of the annual report. These estimates are also included in Table III of the annual report where they are credited to the year in which the field was initially discovered under the headings of "Ultimate Recovery" and "Original Oil-in-Place." (See definitions of "Original Oil-in-Place," and "Ultimate Recovery," pp. 22 and 23.) These two columns in Table III provide a historical record of all discoveries classified according to the year in which each field was first discovered. Discoveries in new fields are credited to the years in which the new fields were found. New pools discovered in old fields are credited to the years in which the old fields were found. Exceptions are made when new pools have special exploratory significance or discovery results from the application of new exploration concepts as compared to those applied in the discovery of the old fields. In such situations, new discoveries are credited to the years in which the new pools were found. Special decisions as to the year to be credited for a particular discovery involve geologic and exploratory judgments made by subcommittee members.

Estimates of ultimate recovery and original oil-in-place for fields discovered in the most recent years are often subject to substantial revision in future years based on information provided by additional drilling, production performance, and the successful installation of improved recovery techniques. For this reason, caution should be exercised in the interpretation of the most recent data of this kind.

GRAPHIC ILLUSTRATIONS

Figures 1 through 4 (Appendix C) serve to illustrate (1) the generalized procedures used in classifying "new field" and "new pool" discoveries; (2) the allocation of acreage between the "drilled" and "undrilled" proved categories; (3) the range in estimates that may be expected under varying conditions and the effect of limited data on the estimates; and (4) the fact that original estimates of discoveries are not restricted to blocked out developed areas if geological information warrants an interpretation of a larger area with proven reserves.

17.

EXTENSIONS

DEFINITION

The ultimate size of newly discovered fields, or newly discovered pools in old fields, is normally determined by drilling in years subsequent to discovery. Wells drilled in subsequent years usually add to the proved area of previously discovered reservoirs, thereby serving to increase estimates of proved reserves. The reserves credited to a reservoir because of enlargement of its proved area are classified as "extensions."

REVISIONS

DEFINITION

Both development drilling and production history add to the basic geological and engineering knowledge of a petroleum reservoir and provide the basis for more accurate estimates of proved reserves in years following discovery. Changes in earlier estimates, either upward or downward, resulting from new information (except for an increase in proved acreage) are classified as "revisions." Revisions for a given year also include (1) increases in proved reserves associated with the successful installation of improved recovery techniques; and (2) an amount which corrects the effect on proved reserves of the difference between estimated production for the previous year and actual production for that year.

COMMENTS

The drilling of additional wells in a reservoir better defines the productive area and provides additional basic geological and engineering data pertaining to the reservoir. Estimates of porosity, interstitial water, pay thickness, and other reservoir factors may be revised on the basis of information provided by additional drilling.

Analysis of the producing history of a reservoir, including production of oil, gas, and water and pressure performance, results in more accurate knowledge of the producing mechanism, recovery efficiency, and the performance of the reservoir. This new and improved

information provides the basis for more accurate estimates of ultimate recoveries and remaining reserves, and results in revisions to previous estimates, either upward or downward.

Changes in reserve estimates brought about by the successful application of fluid injection or other improved recovery techniques are classified and reported as "revisions" to proved reserves. Changes in reserves resulting from a reduction in the estimate of the proved area are reported as "revisions," but changes due to an increase in the proved area are classified and reported as "extensions."

PROVED ACREAGE

DEFINITION

Proved acreage is the area which has been credited with proved reserves. Acreage is credited with proved reserves if the presence of a productive formation has been verified by drilling and testing. Undrilled acreage adjacent to drilled acreage and certain other undrilled acreage are also credited with proved reserves if geological and engineering information demonstrate with reasonable certainty that the underlying formations are continuous and productive.

IMPROVED RECOVERY TECHNIQUES

DEFINITION

Improved recovery techniques include all methods of supplementing natural reservoir forces and energy, or otherwise increasing ultimate recovery from a reservoir. Such techniques include: (1) pressure maintenance; (2) cycling; and (3) secondary recovery in its original sense (i.e., fluid injection applied relatively late in the productive history of a reservoir for the purpose of stimulating production after recovery by primary methods of flowing or artificial lift have approached an economic limit.) Improved recovery techniques also include thermal methods and the use of miscible displacement fluids.

Reserves resulting from the application of any of the methods listed above are reported as "revisions" to proved reserves for the year in which successful testing by a pilot project, or the operation of an installed program in the reservoir, provides support for the engineering analysis on which the project or program was based.

COMMENTS

Additional reserves related to the application of improved recovery techniques are reported as "revisions" to proved reserves, or an "indicated additional reserves," in accordance with the definitions of these terms.

Since it is not possible to separate primary production from production resulting from improved recovery techniques, no attempt is made to classify production and remaining reserves according to the method of recovery.

ORIGINAL OIL-IN-PLACE

DEFINITION

The estimated number of stock tank barrels of crude oil in known reservoirs prior to any production is defined as "original oil-in-place." Known reservoirs include (1) those that are currently productive; (2) those to which proved reserves have been credited but from which there has been no production; and (3) those that have been depleted.

COMMENTS

Original oil-in-place is not to be confused with recoverable oil-in-place. Original oil-in-place is a gross quantity independent of recovery efficiency or economics of operation; recoverable oil-in-place is a net quantity which is dependent upon recovery efficiency and economics of operation.

The estimation of original oil-in-place is based on calculations using the volumetric method or the material balance method when sufficient factual data are available concerning

reservoir rock, fluid properties, reservoir limits, and production performance. Where such data are not available, the estimation of original oil-in-place may be based on information and performance characteristics of reservoirs believed to be comparable.

Oil-in-place estimates are limited to the reservoir area and volumes associated with proved reserves and past production.

ULTIMATE RECOVERY

DEFINITION

Ultimate recovery represents the estimated quantity of crude oil which has been produced from a reservoir and is expected to be produced in the future if there are no substantial changes in current economic and operating conditions.

COMMENTS

Ultimate recovery also may be expressed as the percentage of original oil-in-place which is expected to be eventually produced. This percentage will vary from one reservoir to another in accordance with the erservoir fluid, rock characteristics, and the producing mechanism or drive which is present.

Estimates of ultimate recovery from a given reservoir may be revised in subsequent years if (1) there is a successful application of an improved recovery technique; (2) there is an increase or decrease in the extent of the reservoir; or (3) there is information which indicates that recovery mechanisms are performing more or less efficiently than previously estimated.

PRODUCTIVE CAPACITY OF CRUDE OIL

DEFINITION

Estimates of productive capacities of crude oil developed by the American Petroleum Institute Committee on Reserves and Productive Capacity represent the maximum daily rates of production which can be attained under specified conditions on March 31 of any given year.

The definition of productive capacity used by the Committee is as follows:

> *"The ninety-day crude oil productive capacity is the maximum daily crude production rate, at the point of custody transfer, that could be achieved in ninety days (following December 31 of any given year) with existing wells, well equipment, and surface facilities – plus work and changes that can be reasonably accomplished within the time period using present service capabilities and personnel and with productivity declining as it would under capacity operation."*

Estimates of the productive capacity for particular fields or reservoirs are based on proved acreage, wells, well equipment, and surface production facilities as of the previous December 31, with adjustments for (1) increases in productive capacity which would result from alterations and improvements in existing facilities and programs for development drilling and improved recovery techniques, which could be completed within the ninety-day period with existing capabilities and personnel; and (2) the natural decreases in productive capacity resulting from capacity operations during the ninety-day period. It should be noted, however, that there is no adjustment for additions to reserves and increased productive capacity that might result from exploratory drilling during the ninety-day period. Furthermore, estimates do not include quantities of crude oil in lease storage on March 31 which could be drawn upon at the time of capacity operation.

Estimates prepared by the Committee are based on the following assumptions:

1. There will be no restrictions on production resulting from a lack of markets for crude oil.

2. There will be no change in crude oil prices or the unit cost of materials, equipment, and labor within the ninety-day period allowed for the buildup of capacity.

3. There will be no statutory restrictions on production, but gas and water production will be controlled according to prudent and accepted engineering practices, where appropriate, to prevent the significant reduction of crude oil recovery. The only other production restrictions applicable would be those which prohibit the pollution of water and those which prohibit air pollution with gas or the creation of fire hazards from gas by operations up to the point of transferring the gas to market or to gas processing facilities.

4. There will be no restrictions on production resulting from the inadequacy of storage or transportation facilities beyond the point of custody transfer.

5. Intrafield equity considerations will be satisfactorily resolved so that production for given fields can be maximized.

COMMENTS

For the guidance of subcommittee members, individual elements of the working definition of productive capacity may be interpreted as follows:

1. Maximum daily crude production rate – The figures reported in most cases reflect production that could be obtained from the proved and, in some instances, the indicated additional reserves as defined and reported by the API Committee on Reserves and Productive Capacity. The definition excludes reserves and producing capacity that might be developed by exploratory drilling during the 90-day period. The concept implies nothing about the determined rate being sustainable over any specified period of time – it is simply a point on a continuous curve. The production decline rates applicable in each specific field are considered in determining the capacity at the end of the 90-day period. Data are reported as of December 31 and reflect the capacity that would be developed by March 31, based on field conditions and information as of December 31.

2. Point of custody transfer – The point in the production system at which capacity is estimated is that point at which the oil is transferred from the producing function to the transportation function. In most cases the point of transfer would be where the oil is put into another system (pipeline, truck, barge, etc.) for movement to refineries or terminals. The selection of this point to measure capacity implies that not only may reservoir characteristics and down-hole equipment place limitations on capacity, but well-head equipment separators, flow lines, lease tanks, intrafield barges and other oil handling facilities may also create limitations.

3. That could be achieved in ninety days with existing wells, well equipment and surface facilities – plus work and changes that can be reasonably accomplished within the time period using present service capabilities and personnel – The wells considered include those already producing, those shut in that could and would be put on stream, and development wells on proved acreage which would be completed and put on stream within ninety days. Various changes in, or additions to, down-hole and well-head equipment and lease facilities could be made; e.g., pumps, tubing, flow lines, separators, etc. Also, certain steps could conceivably be taken to stimulate or improve production from the reservoir; this includes various types of formation treatments and workovers. The limitation imposed by the definition of such changes or additions is that they must be capable of being completed in ninety days with present services, personnel, material, and equipment capabilities. For example, although it may be desirable to work over most of the wells in a given field, work-over equipment and personnel, reasonably expected to be available, may only be capable of handling a few wells; or, it may be desirable to install larger pumping units or flow lines in a field, but the equipment cannot be obtained and installed in this short a time. It should be assumed that all fields would be undergoing such servicing and improvement and that no one field could expect a larger share of services, equipment or personnel than it would receive in normal times.

4. With productivity declining as it would under capacity operation – It was mentioned under item 1. that consideration should be given to the declining production capability of a reservoir over time – in this case, 90 days. The specific rate of decline selected will vary from field to field and will be determined by the particular set of circumstances in each field. Both reservoir characteristics and ability of well and surface equipment to handle maximum production will influence the choice of a decline rate; however, in all instances, it is assumed that production over the time period will be limited only by facilities and equipment or the reservoir itself. For example, two fields with similar reservoir characteristics may have drastically different producing rates if one has a restriction imposed by separator capacity and the other does not; as a result the two fields may have drastically different decline rates.

5. It is assumed that there would be no change in crude oil prices or costs of material, equipment and/or labor – This is a simplifying assumption to avoid predicting movements of crude oil prices and operating costs. The intent is to emphasize the capacity that would be developed because of incentives accruing from additional production and not from incentives resulting from increased crude oil prices. It is conceivable that total operating expenses might be increased, but the increase would result from the use of more labor, services, equipment, etc., and not from a rise in the prices of these items.

6. No statutory restrictions on producing rates (but adhering to judicious operating practices) – All market demand restrictions are removed and the maximum daily producing rates established for a field by regulatory agencies (statutory MER's) can be increased if in the judgment of the Subcommittee these rates may be exceeded without causing a significant reduction in ultimate crude oil recovery. It would be assumed that intrafield equity considerations can be satisfactorily resolved so that a field's production can be maximized. Gas-oil and water-oil ratio limitations cannot be ignored where it would violate prudent and accepted enginerring practices and result in a significant reduction in ultimate crude oil recovery. The only other production restrictions applicable would be those which prohibit the pollution of potable water sources and those which prohibit air pollution with gas or the creation of fire hazards from gas by operations up to the point of transferring the gas to market or to gas processing facilities. No limitations should be imposed due to a limited gas market or limited capacity of existing gas processing facilities.

7. No restrictions on storage or transportation beyond the point of custody transfer and no marketing constraints – It is assumed that transportation facilities, storage, refineries, terminals, and markets are adequate, and so situated, to accomodate all the oil made available at the point of custody transfer if the current market prices for crude oil persist.

Estimates of productive capacity are, to the extent practicable, handled on a field-by-field basis giving consideration whenever possible to basic production units within a field. Priority attention is given to those fields believed to have significantly large excess productive capacities.

SECTION C. GEOLOGICAL INFORMATION ON OIL OCCURRENCE

INTRODUCTION

Current estimates of original oil-in-place and the ultimate recovery of crude oil from known reservoirs (including those considered to be depleted) are differentiated by age, by lithology, and by type of entrapment.

To the extent possible, the occurrence of oil is classified on the basis of a review of individual reservoirs. Where single reservoirs overlap various categories or cumulative production from several reservoirs cannot be separately identified, the district subcommittees exercise judgment in (1) allocating estimates of production, original oil-in-place, and ultimate recovery to the various categories; or (2) assigning all estimates to the category which dominates the ultimate recovery from the field. New information on reservoirs regarding age, lithology, and type of entrapment may cause some adjustments in previously published data; however, major annual revisions usually reflect revisions in estimates of original oil-in-place and ultimate recovery.

OIL BY AGE OF RESERVOIR ROCK

The distribution of crude oil by geologic age of the reservoir rock is reported in terms of estimated ultimate recovery (cumulative production from both producing and depleted fields plus remaining proved reserves) and the estimated original oil-in-place which is related to such recovery. The published compilation is on a total basis for the United States and according to geologic age units as follows:

ERA	SYSTEM	SERIES
Cenozoic	Quaternary	Recent Pleistocene
	Tertiary	Pliocene Miocene Oligocene Eocene Paleocene

ERA	SYSTEM	SERIES
Mesozoic	Cretaceous	–
	Jurassic	–
	Triassic	–
Paleozoic	Permian	–
	Pennsylvanian	–
	Mississippian	–
	Devonian	–
	Silurian	–
	Ordovician	–
	Cambrian	–
Pre-Cambrian	–	–

It should be recognized that the age period of a limited number of reservoirs has not been firmly established particularly where dual classifications such as Permo-Pennsylvanian, Cambro-Ordovician, etc. have been traditionally applied. In such cases the younger age is assigned unless reasonable evidence is available to the contrary. Additional problems are presented for multi-reservoir fields when production is commingled or not identifiable from the individual reservoirs of different ages. When a reasonable basis for assignment to different ages is not available, the age of the reservoir which dominates as to ultimate recovery is used.

OIL BY RESERVOIR LITHOLOGY

The occurrence of crude oil according to the lithology of the reservoir rock is reported in terms of estimated ultimate recovery (cumulative production plus remaining proved reserves) and the estimated original oil-in-place of both depleted and currently proved reservoirs.

The three lighologic categories used in reporting oil occurrence are defined as follows:

1. Sandstone – A sedimentary rock composed predominantly of quartz grains or other non-carbonate mineral or rock detritus. Included in this reservoir type are unconsolidated sand, sandstone, siltstone, graywacke, arkose, granite wash, conglomerate, and sedimentary breccia.

2. Carbonate – A sedimentary rock composed predominantly of calcite (limestone) and/or dolomite. Clastic carbonates are included in this category.

3. Other – All reservoirs not fitting the definitions of the sandstone and carbonate categories. Included in this reservoir type are igneous and metamorphic rocks and some sedimentary rocks (i.e., fractured shale and chert).

In multi-reservoir fields having more than one type of reservoir lithology, reservoirs are individually handled to the extent possible. Where cumulative production from different types of reservoirs cannot be estimated with reasonable accuracy, the ultimate recovery and original oil-in-place are credited to the lithology which is believed will supply the greatest recovery for the field.

OIL BY TYPE OF ENTRAPMENT

Crude oil occurrence according to two broad categories of entrapment types is reported in terms of estimated ultimate recovery (cumulative production plus remaining proved reserves) and original oil-in-place for the depleted and currently proved reservoirs.

The two types of entrapment are defined as follows:

1. Structural – An entrapment in which fluid migration of hydrocarbons in the reservoir rock has terminated primarily because of closure induced by structural deformation and/or hydrodynamic forces. Most Gulf Coast piercement salt dome reservoirs are included in this category.

2. Stratigraphic – An entrapment in which fluid migration of hydrocarbons has terminated because of (a) the pinchout of a reservoir rock due either to truncation or non-deposition, or (b) a facies change in the form of diminished permeability of the reservoir rock. Also included in this category are entrapments in which a pinchout or facies change provides part of the barrier to migration of hydrocarbons and structural elements provide the remaining closure for entrapment.

In multi-reservoir fields where both of the two types of entrapment occur, estimates of ultimate recovery and original oil-in-place for each individual reservoir are assigned to the appropriate category if it is reasonable to do so. In those cases where production from different types of entrapments cannot be separately identified, ultimate recovery and original oil-in-place for a combination of reservoirs are assigned to the category which is expected to provide the larger ultimate recovery.

27.

SECTION D. GEOGRAPHIC BOUNDARIES

Data pertaining to reserves and productive capacity are reported for each state. Additional geographic detail is reported for the land areas of California, Louisiana, New Mexico, and Texas. (See Maps II, III, IV, and V, Appendix B.)

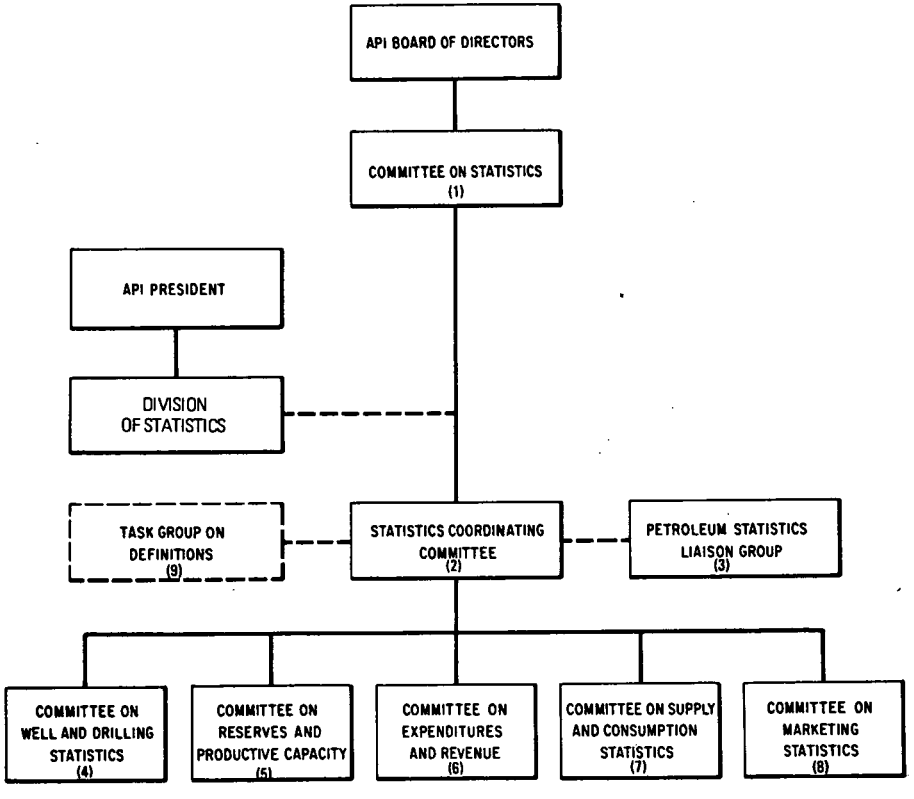
As a general rule, reserves and productive capacity figures for offshore areas are not reported separately but are included in the totals for adjacent land areas. In the case of Louisiana and Texas, offshore proved reserves of crude oil are included in the state totals, but also reported separately as a combined total for these two states. The same practice is observed in reporting other reserves data and productive capacity estimates for Louisiana and Texas.

The term "offshore" is defined as that geographic area which lies seaward of the coastline. In general, the term "coastline" means the line of ordinary low water along that portion of the coast which is in direct contact with the open sea or the line marking the seaward limit of inland waters. If a state agency uses a different basis for identifying onshore and offshore areas, the state classification is used.

APPENDIX A

APPENDIX A

ORGANIZATION OF API STATISTICAL SERVICES



Footnotes 1 - 9 appear on following page.

FOOTNOTES PERTAINING TO APPENDIX A

ORGANIZATION OF API STATISTICAL SERVICES

1. Committee on Statistics: Functions – (1) prepares for Board approval policies on API compilation and publication of statistics; (2) provides policy direction for the API Division of Statistics and API committees engaged in statistical activities; (3) conducts studies of adequacy of industry statistical programs; and, (4) reports to the Board on API statistical activities.

2. Statistics Coordinating Committee: Function – coordinates assignments of committees and insures consistency of statistics reported throughout API organization.

3. Petroleum Statistics Liaison Group: Function – meets periodically in an advisory capacity with Statistics Coordinating Committee to review current statistical programs and propose new and revised information systems.

4. Committee on Well & Drilling Statistics: Function – reviews and evaluates statistical series pertaining to wells, drilling, and exploratory activities; recommends procedures and sources of well and drilling data.

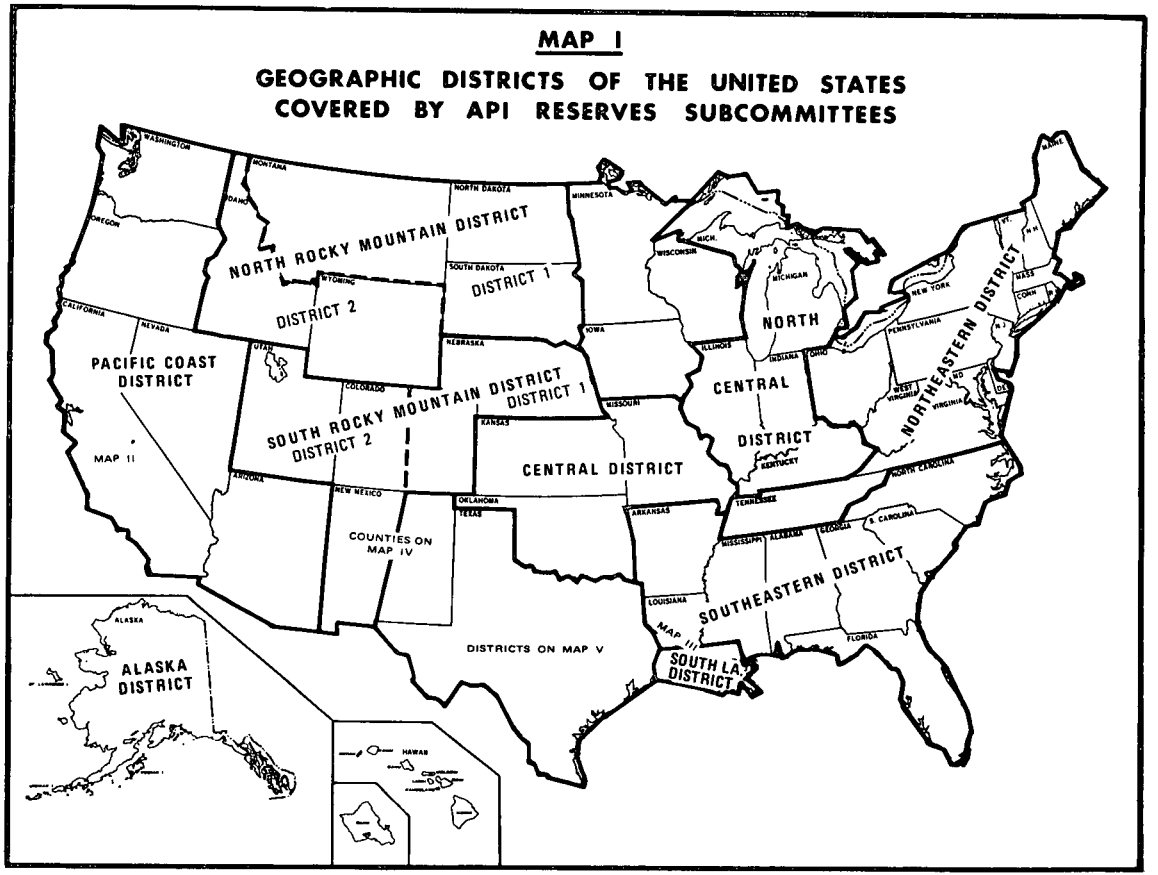
5. Committee on Reserves & Productive Capacity: Function – prepares annual estimates of U. S. crude oil reserves and productive capacity.

6. Committee on Expenditures & Revenues: Function – reviews and evaluates statistical series pertaining to drilling costs, and estimated expenditures and receipts of U. S. oil and gas producing industry; recommends procedures and sources of expenditure and revenue data in the areas of exploration, development, and production.

7. Committee on Supply & Consumption Statistics: Function – maintains surveillance over statistics relating to crude oil, NGL, and natural gas production, crude oil and product inventories, transportation of petroleum and its products, refining output and capacity, petrochemical intermediate production, and consumption by broad categories of refinery output.

8. Committee on Marketing Statistics: Function – maintains surveillance over data of a marketing nature, such as dealer turnover surveys, service station statistics, product price indexes, lubricant consumption by state, petroleum wax, product sales by area and class of customer, and market survey information on petroleum consumers.

9. Task Group on Definitions: Function – reviews definitions used by various API statistical committees and other agencies; develops standard definitions recommended for statistical purposes and promotes their use by various committees and agencies.


MAP I
GEOGRAPHIC DISTRICTS OF THE UNITED STATES
COVERED BY API RESERVES SUBCOMMITTEES
NORTH ROCKY MOUNTAIN DISTRICT
DISTRICT 1
DISTRICT 2
PACIFIC COAST DISTRICT
MAP II
SOUTH ROCKY MOUNTAIN DISTRICT
DISTRICT 1
DISTRICT 2
CENTRAL DISTRICT
COUNTIES ON MAP IV
DISTRICTS ON MAP V
NORTH CENTRAL DISTRICT
NORTHEASTERN DISTRICT
SOUTHEASTERN DISTRICT
MAP III
SOUTH LA. DISTRICT
ALASKA DISTRICT
HAWAII
WASHINGTON
OREGON
CALIFORNIA
NEVADA
IDAHO
MONTANA
WYOMING
UTAH
ARIZONA
COLORADO
NEW MEXICO
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
OKLAHOMA
TEXAS
MINNESOTA
IOWA
MISSOURI
ARKANSAS
LOUISIANA
WISCONSIN
ILLINOIS
MICHIGAN
INDIANA
OHIO
KENTUCKY
TENNESSEE
MISSISSIPPI
ALABAMA
GEORGIA
FLORIDA
S. CAROLINA
NORTH CAROLINA
VIRGINIA
WEST VIRGINIA
PENNSYLVANIA
NEW YORK
MICH.
MAINE
VT.
N.H.
MASS.
CONN.
R.I.
N.J.
DEL.
MD.

33.

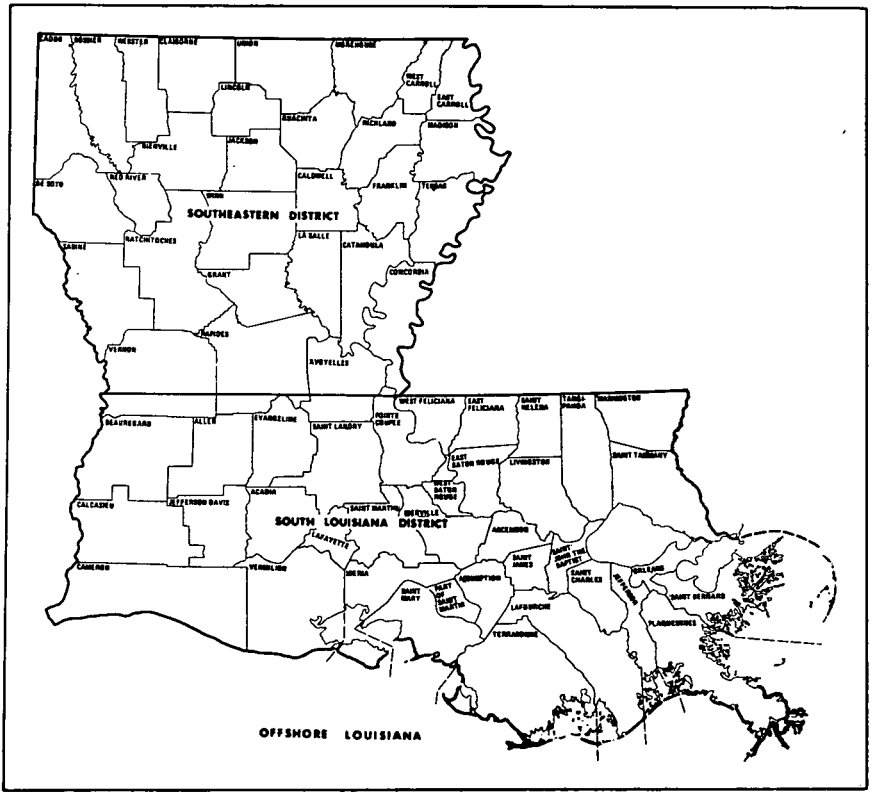
MAP II

SUBDIVISIONS OF CALIFORNIA USED IN REPORTING RESERVES DATA

34.

MAP III

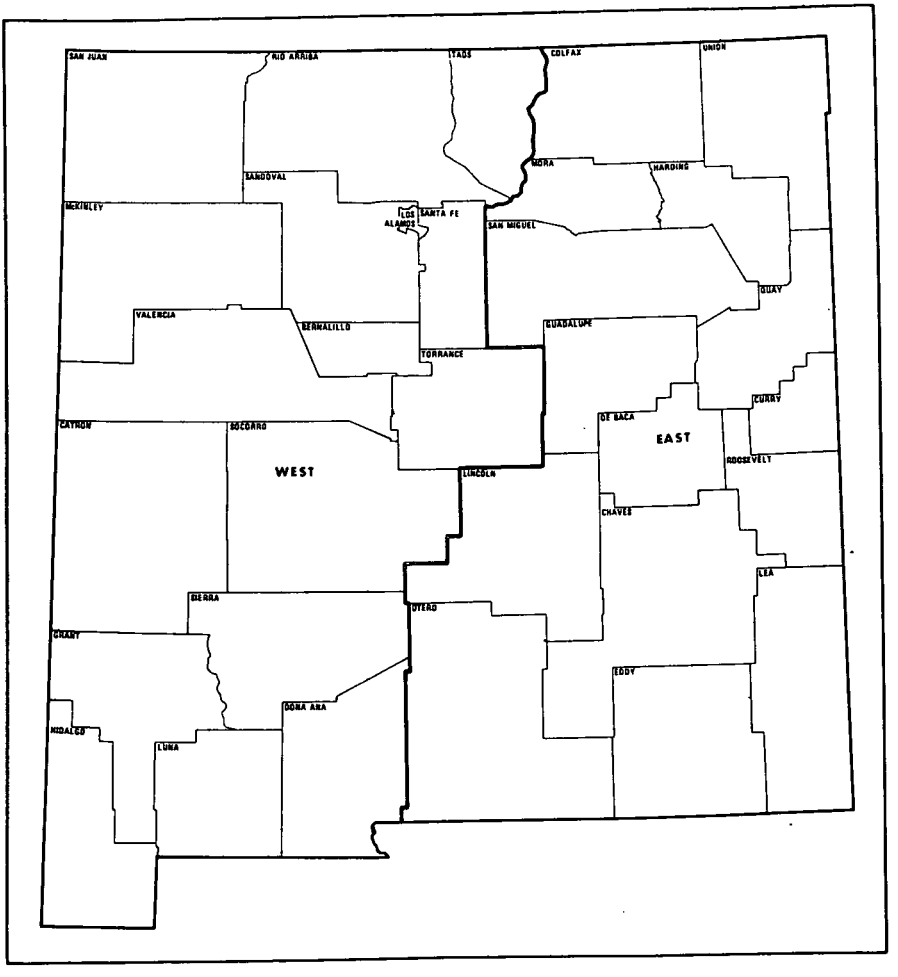
SUBDIVISIONS OF LOUISIANA USED IN REPORTING RESERVES DATA



35.

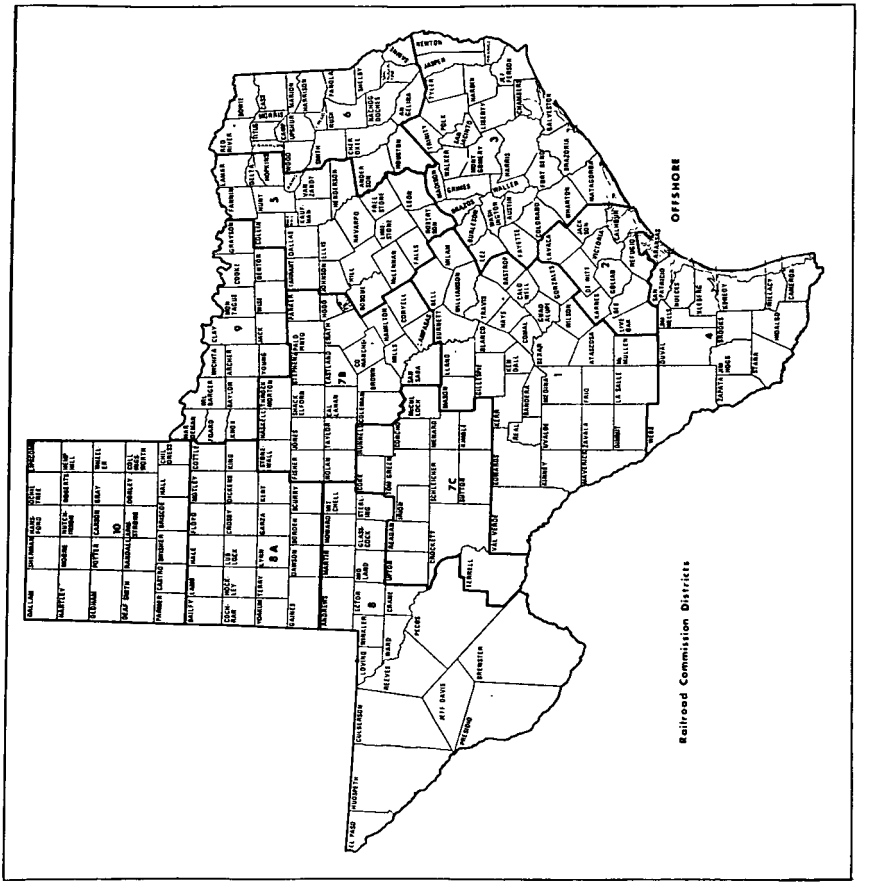
MAP IV

SUBDIVISIONS OF NEW MEXICO USED IN REPORTING RESERVES DATA



MAP V

SUBDIVISIONS OF TEXAS USED IN REPORTING RESERVES DATA



APPENDIX C

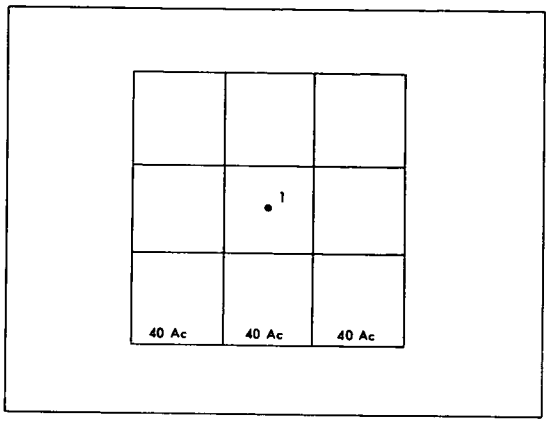


FIGURE 1 – NEW FIELD DISCOVERY

No additional well control in immediate vicinity and little data on type and extent of structure.

CASE I – Discovery in a reservoir known to have a wide areal extent. (Blanket sand or porosity)

A. Discovery has reasonably thick producing section, 30 feet, all saturated. Regional rate of dip 150 to 200 feet per mile. Prove 60 to 100 acres on initial estimate.

B. Thick producing section, as (A) but dips are steep. Prove 20 to 40 acres on initial estimate.

C. Thin reservoir, 6 to 10 feet of saturation normal rate of dip. Prove 20 to 40 acres on initial estimate.

CASE II – Discovery in a reservoir known to have lenticular or variable porosity and permeability. Prove 10 to 20 acres on initial estimate.

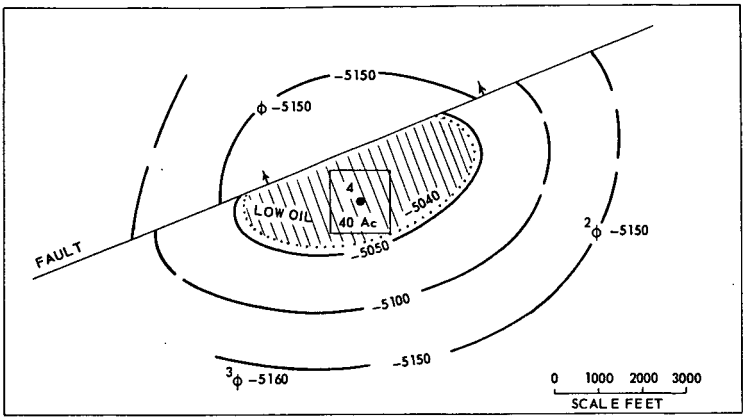


FIGURE 2 – NEW FIELD DISCOVERY IN AREA OF ADDITIONAL WELL CONTROL

Discovery Well No. 4 proved production in reservoir from sub-sea 5000 to 5040. Proved area limited by structural position of low oil occurrence. Proved drilled area 40 acres, proved undrilled area 170. Total proved area on initial estimate 210 acres.

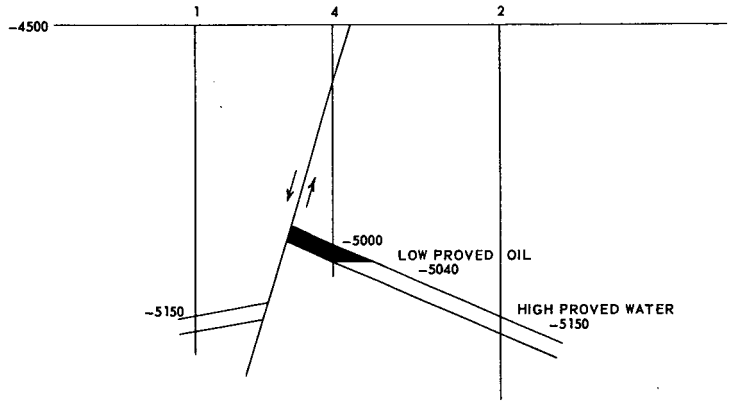


FIGURE 2–A – CROSS–SECTION OF STRUCTURE IN FIGURE 2

Wells drilled in numerical sequence. Reservoir volume between fault and low proved oil occurrence considered proved. Reservoir volume between low proved oil and highest proved water is prospective.

40.

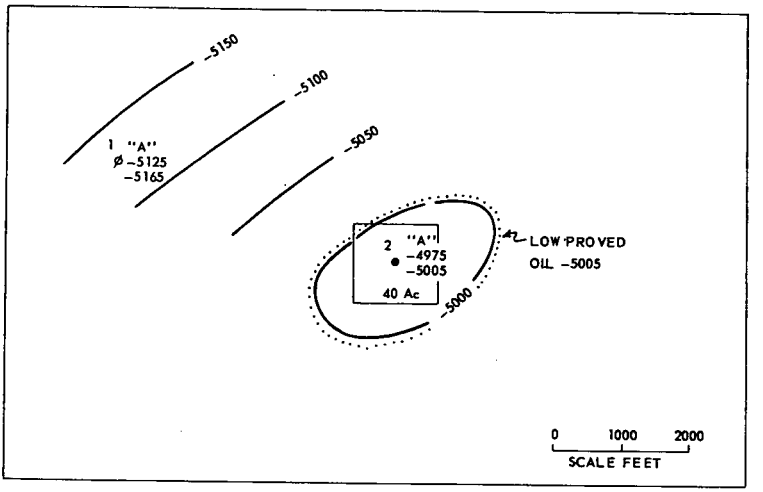


FIGURE 3 – NEW FIELD DISCOVERY

Reservoir "A" with 30 feet of oil saturated reservoir. One oil completion, Well No. 2. Rate of dip on structure 225 feet per mile indicated by data on Well No. 1, dry hole. Proved drilled area 40 acres. Total proved area 90 acres on initial estimate including 50 acres proved undrilled.

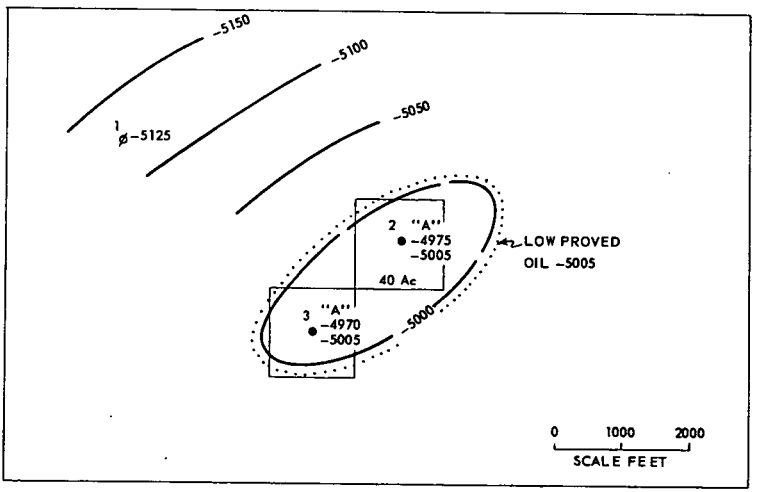


FIGURE 3–A – NEW FIELD DISCOVERY

Completion of extension Well No. 3 in discovery Figure No. 3. Proved area of Reservoir "A" increased to 140 acres. Oil column is 35 feet, from sub-sea 4970 to 5005 as reservoir was found to be 5 feet thicker than in Well No. 2. Developed or proved drilled area is 80 acres. Total proved area 140 acres.

41.

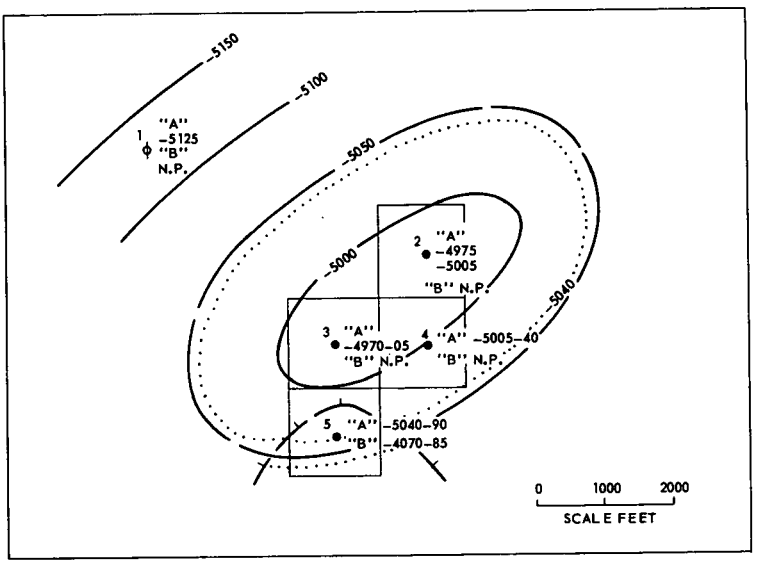


FIGURE 3–B – NEW FIELD DISCOVERY

Completion of Well No. 4 in New Field Discovery Figure 3, confirms structural interpretation of Figure 3–A, and estend oil column in Reservoir "A" to sub-sea 5040. Proved drilled area 120 acres; total proved area 425 acres. Well No. 5 tested water in Reservoir "A" below sub-sea 5040 and proved the limits of the reservoir on the south side of the structure; and also, discovered oil accumulation in a new reservoir "B" from sub-sea 4070 to 85. New Pool discovery assigned 15 to 20 acres on initial estimate. Reservoir "B", not present in Wells Nos. 1, 2, 3, and 4.

42.

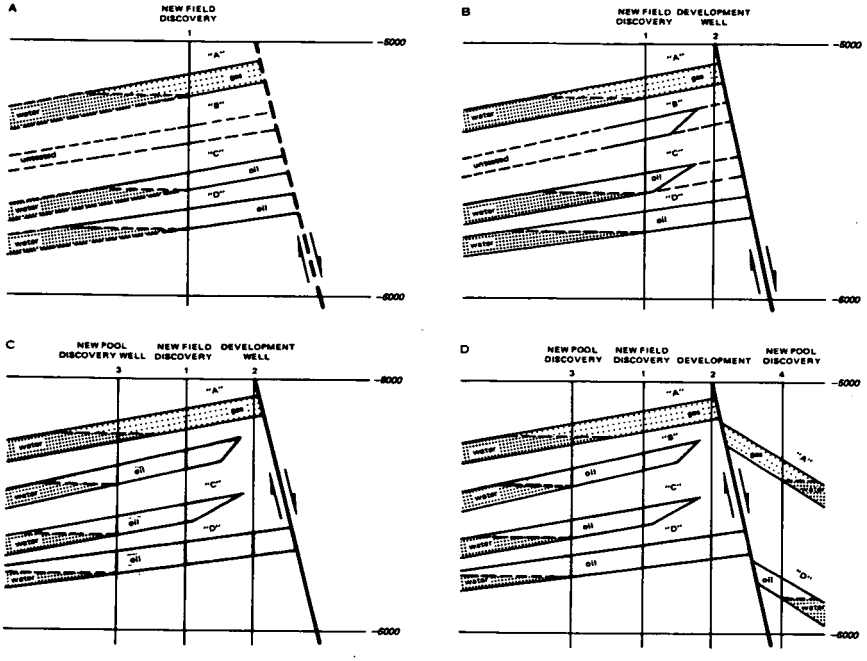


FIGURE 4 – CROSS-SECTION OF FIELD DISCOVERY (Wells Drilled in Numerical Sequence)

New Field Discovery Well No. 1 tested gas in Reservoir "A" and oil in "C" and "D". Reservoir "B" not tested. Well completed as dual oil well in Reservoirs "C" and "D".

Development Well No. 2 completed as an oil well in Reservoir "D". Reservoirs "B" and "C" not present. Productive area of Reservoir "C" initially considered proved between Well No. 1 and fault, revised downward on basis of new information.

Development Well No. 3 extends the proved area and defines the limits of Reservoir "A". Tests oil in Reservoir "B". Completed as dual well in "C" and "D". Classified as new pool discovery in Reservoir "B". Reserves in Reservoirs "A" and "B" are classified as proved but undeveloped if they are not to be produced by Wells 1, 2, or 3.

New Pool Discovery Well No. 4 drilled at location across fault found in Wells Nos. 1 and 2 is an exploratory well which tests gas in Reservoir "A" and oil in Reservoir "D". This well classified as new pool discovery by proving production in separate structural segment.

APPENDIX D

ARITHMETIC RELATIONSHIPS APPLICABLE TO TABLES PUBLISHED IN ANNUAL REPORTS

TABLE I:

Col 2 for current year = Col 8 for previous year
Col 2 + Col 3 + Col 4 + Col 5 + Col 6 − Col 7 = Col 8
Col 8 − Col 2 = Col 9

TABLE III (For Individual States):

Total of Col 2 = State total in Col 3 of Table IV
Total of Col 4 = State total in Col 4 of Table IV
Total of Col 5 = State total in Col 2 of Table IV
Production for current year in Col 2 = State total in Col 7 of Table I
Col 4 for current year is equal to or less than Col 5 + Col 6 for state in Table I

TABLE IV (For Individual States):

Col 4 − Col 3 = State total in Col 8 of Table I

TABLE V (For Individual States):

Col 2 + Col 3 + Col 4 = State total in Col 2 of Table IV
Col 5 + Col 6 + Col 7 = State total in Col 4 of Table IV

TABLE VI (For Individual States):

Total of Col 2 = State total in Col 2 of Table IV
Total of Col 3 = State total in Col 4 of Table IV

TABLE VII (For Individual States):

Col 2 + Col 3 = State total in Col 2 of Table IV
Col 4 + Col 5 = State total in Col 4 of Table IV

EXHIBIT D

AMERICAN PETROLEUM INSTITUTE

DIVISION OF STATISTICS

1974 — PUBLICATIONS —1974

Annual Statistical Review

An annual report containing operating statistics for the U.S. petroleum industry by years, and months for the latest two years for which data are available. The next issue which will include data for 1956-1973 will be available in April 1974.

Price per copy.

U.S., Canada and Mexico	$8.50
Overseas	$8.00

Joint Association Survey (Sections I and II – 1972)

Published jointly with the Independent Petroleum Association of America, and the Mid-Continent Oil & Gas Association. Section I includes the estimated cost of drilling oil wells, gas wells, and dry holes by depth range for major areas in the United States. Section II includes estimated expenditures for oil and gas exploration, development, and production in the United States.

Price per copy.

U.S., Canada and Mexico	$4.00
Overseas	$5.00

Liquefied Petroleum Gas Report

A monthly publication which includes inventories of liquefied petroleum and liquefied refinery gases located at plants and refineries, and in underground storage, by areas, and by individual products.

Annual Subscription, including First Class postage to locations as follows:

U.S., Canada and Mexico	$14.00
Overseas	$16.00

MONTHLY REPORT ON DRILLING ACTIVITY IN THE UNITED STATES

A monthly publication which shows by states the number of oil wells, gas wells, dry holes, stratigraphic and core tests, and service wells, reported as completed to the American Petroleum Institute; and a table showing exploratory wells (oil, gas, and dry) by states. Also includes a summary of oil wells, gas wells, and dry holes in the development and exploratory categories.

Annual Subscription, including First Class postage to locations as follows:

U.S., Canada and Mexico	(twelve issues) $12.00
Overseas	(twelve issues) $14.00

Magnetic Tape Files for Well and Drilling Statistics

These tapes contain data for all wells reported in 1967-1973. Reported wells include all developmental wells, exploratory wells, stratigraphic and core tests, service wells, and old wells drilled deeper related to exploration and the production of crude oil and natural gas. Prices available upon request.

Quarterly Review of Drilling Statistics — 1974

Includes quarterly and annual tabulations of U.S. drilling statistics compiled by the American Petroleum Institute. Wells and footage drilled are reported by type of well for each state and major areas of states. Special tabulations are also shown for multiple completion wells.

Annual Subscription.

U.S., Canada and Mexico	$12.00
Overseas	$14.50

Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada and United States Productive Capacity as of December 31, 1973

Published jointly with the American Gas Association and the Canadian Petroleum Association.

Report for 1973 (available in June 1974) will include end of year reserves data for crude oil, natural gas liquids and natural gas in the United States and Canada. U.S. data include ultimate recovery and original oil-in-place by year of discovery; and reserves of crude oil and natural gas by reservoir lithology, geologic age of reservoir rock, and type of entrapment.

Price per copy.

U.S.	$5.00
Canada and Mexico	$6.00
Overseas	$6.50

Weekly Statistical Bulletin

A weekly publication containing U.S. data relating to refinery activity and principal inventories; crude oil and product imports; crude oil production; gasoline consumption by states; etc.

Annual Subscription, including First Class postage to locations as follows:

U.S., Canada and Mexico	$17.50
Overseas	$28.50

Technical Report No. 1: "Standard Definitions for Petroleum Statistics," First Edition

Part I — Reserves and Production Definitions
Part II — Wells and Drilling Definitions

Price per copy.

U.S., Canada and Mexico	$5.00
Overseas	$6.00

Technical Report No. 2: "Organization and Definitions for the Estimation of Reserves and Productive Capacity." First Edition, June 1970

Part I – Crude Oil

Price per copy	
U.S., Canada and Mexico	$5.00
Overseas	$6.00

Instructions for Completing Individual Well Tickets for U.S. Drilling Statistics, Second Edition, January 1, 1972.

Part I – Cards 1 & 2 (API)
Part II – Card 3 (AAPG–CSD)

Price per copy	
U.S., Canada and Mexico	$5.00
Overseas	$6.00

Annual Summaries

The following items are published annually. **$.25 each, plus postage for multiple copy orders.**

SUMMARY OF DISABLING WORK INJURIES IN THE PETROLEUM INDUSTRY
SUMMARY OF MOTOR VEHICLE ACCIDENTS IN THE PETROLEUM INDUSTRY
REVIEW OF FATAL INJURIES IN THE PETROLEUM INDUSTRY
SALES OF WAX BY END–USE CATEGORIES
REPORTED FIRE LOSSES IN THE PETROLEUM INDUSTRY

Chairman PROXMIRE. Gentlemen, we are very fortunate to have this morning three men who represent agencies and who personally probably know as much about the energy shortage as any three men we could possibly have as far as the statistics and available information that exists.

Mr. Rigg, you have responsibilities, I indicated when I introduced you, over four of the most important agencies that gather information in the petroleum field.

Mr. Shiskin, you are the most responsible person in our government for price statistics, not only in petroleum but other agencies.

And Mr. Hodges, you speak for the industry association which has provided most of the material that is available.

I would like to ask you, Mr. Rigg, and Mr. Hodges, particularly, and I will come to Mr. Shiskin on other questions later—I would like to ask Mr. Rigg and Mr. Hodges about the actual existence of an energy shortage. I would like to have you give us a little documentation on it because I think the American people want that, would like to hear it, would like to hear some justification. As you know, there is a lot of skepticism about the extent and even the existence of the oil shortage. At least two recent quite authoritative and impressive articles throw further doubt on the matter. An article in last week's Science magazine shows that the demand for energy is down, demand is down and supplies are up. According to it:

Incoming supplies and stockpiles are larger than they were one year ago and that overall major inventories are greater than those of a year ago.

In yesterday's Washington Post Christopher Rand writes, and I quote: "There is no gasoline shortage." There is no gasoline shortage in January because there was no crude oil shortage in December. Rand maintains that if Caribbean refineries owned by the majors are taken into account, there is a refinery capacity shortfall of only 500,000 barrels a day, or 3.1 percent of the total demand, but that the companies' own product stocks stood at 513.7 million barrels on December 21, enough for 1,000 days of shortfall.

What is your response to these statements? Has the shortfall actually occurred, are we talking about a prospective shortage which has not occurred but which may materialize in the future?

Mr. RIGG. Mr. Chairman, I read Mr. Rand's article in the paper yesterday also. I do believe there is an energy shortage.

Now, I use the term "guardedly" in the respect of using it as far as availability goes. As you look at the world there is plenty of oil in the world for our needs. If you look at the United States——

Chairman PROXMIRE. That is fascinating. That statement coincides with what Ralph Nader told us. He had a little more colorful language. He said the world is drowning in oil. You said there is plenty for our needs worldwide if we could get it.

Mr. RIGG. But it isn't available and it is the same thing domestically. We haven't increased our domestic refining capacity of any marked degree and many of the refineries suffer from what I call energy octogenarianism, pretty old and inefficient.

Chairman PROXMIRE. Are Caribbean refineries available to us?

Mr. RIGG. Yes, they are, and they are putting refined products into the United States from the Caribbean area, but also you have

the problem, which I think is as important as anything else, of an increase in the demand for your refined products.

When you increase the amount of automobiles 10 percent every year for 3 or 4 years you have a lot more people driving and there are more people coming down to the pump all the time to get gasoline and the gasoline isn't available in the amounts needed.

Chairman PROXMIRE. You see, the statements by Mr. Rand and the statement of Science magazine referred to the fact that the amount available is more this year than last year. Certainly there is the implication that even limited conservation measures we have taken so far have resulted in some diminution in demand. At least it is not greater than it was last year. And the 1,000 days of shortfall, enough to take care of 1,000 days of shortfall, that is 3 years, would seem to be reassuring.

Mr. RIGG. I don't know whether the thousand days of shortfall is an accurate statement or not. I thought the latest figures I had seen showed only about a 30-day supply.

Chairman PROXMIRE. Then would you say that Mr. Rand is wrong?

Mr. RIGG. No; I would have to check it out. I haven't had opportunity this morning to compare it.

Chairman PROXMIRE. Will you check on it and let us know?

Mr. RIGG. We will be delighted to submit it to you.

[The following information was subsequently supplied for the record:]

How many days of gasoline supply does the United States have in gasoline stocks based on API Jan. 18 weekly report and Bureau of Mines October 1973 Report?

	Barrels
API—Week ending Jan. 18, 1974:	
Motor gasoline production [1]	41, 447, 000
Motor gasoline imports	812, 000
Motor gasoline stock change [2]	−2, 183, 000
Total supply during week [3]	40, 076, 000
Daily supply	5, 725, 000
Primary stocks (Jan. 18) [4]	208, 116, 000
Daily need	5, 725, 000
Total supply (in days)	36
Bureau of Mines—October 1973:	
Motor gasoline production	205, 467, 000
Motor gasoline imports	6, 020, 000
Motor gasoline exports	−252, 000
Motor gasoline stock change [2]	−4, 251, 000
Total supply during month	206, 984, 000
Daily supply	6, 677, 000
Primary stocks (Oct. 31) [4]	214, 610, 000
Daily need	6, 677, 000
Total supply (in days)	32

[1] Excludes small amounts of motor gasoline produced at natural gas process plants.
[2] A plus means a stock withdrawal and a minus means an addition to stocks.
[3] API weekly data excludes exports.
[4] Primary stocks (or inventories) are those located at refineries, bulk terminals, and in pipelines. An estimated 35 to 40 percent of these inventories are unavailable for shipment as they are required to assure continuous operations.

WEEKLY STATISTICAL BULLETIN

Week Ended January 18, 1974

NOTICE

Input to refineries on a total U.S. basis during the week ended Jan. 18, 1974 decreased 298,000 bbl. per day from the previous week, with the result that utilization of operable refining capacity dropped to 84.4 per cent. The decline in input was principally due to lack of crude oil and scheduled and unscheduled shut downs for maintenance and repairs. The largest decreases (in barrels per day) occurred in the following districts: West Coast (District 5)—110,000; Texas Gulf Coast—62,000; Indiana, Illinois, Kentucky—41,000; and the East Coast—26,000.

Production of distillate fuel oil in the U.S. increased 47,000 bbl. per day during the same week at the expense of other products.

While crude oil imports in Districts 1–4 increased in the week by 68,000 bbl. per day to 1,895,000, imports of crude oil into the West Coast (District 5) dropped by 244,000 bbl. per day to a level of 276,000, with the result that total crude oil imports into the U.S. of 2,171,000 bbl. per day were down by 176,000 bbl. per day from the previous week. This is the lowest U.S. level since the week ended February 9, 1973—2,143,000 bbl. per day.

Total stocks of crude oil in the U.S. declined by 1,232,000 bbl. per day during the week to a level of 230,818,000 bbl. A drop in crude oil of domestic origin of 684,000 bbl. per day combined with crude oil stocks of foreign origin declining 548,000 bbl. per day made up the total decrease in stocks.

The processing of foreign crude oil at a rate of 2,586,000 bbl. per day for the week, the lowest level since the week ended February 23, 1973—2,577,000 bbl. per day.

American Petroleum Institute, Division of Statistics and Economics

INPUT TO CRUDE OIL DISTILLATION UNITS AND PRODUCTION OF THE FIVE MAJOR PRODUCTS

[Daily average in thousands of 42-gal barrels]

	Crude oil distillation units				Refinery production [1]				
	Crude runs	Input to crude oil processing units	Operable capacity	Percent operated	Motor gasoline	Jet fuel (naphtha type)	Jet fuel (kerosine type)	Distillate fuel oil	Residual fuel oil
East coast	[2] 1,175	[3] 1,244	1,463	85.0	606	9	38	442	137
Appalachia No. 1	161	162	189	85.7	71	4	----	45	20
District 1 total	[2] 1,336	[3] 1,406	1,652	85.1	677	13	38	487	157
Appalachia No. 2	39	39	60	65.0	29	----	----	7	3
Indiana, Illinois, Kentucky	2,074	2,142	2,542	84.3	1,161	13	76	510	168
Minnesota, Wisconsin, North Dakota, South Dakota	224	236	287	82.2	140	3	3	66	27
Oklahoma, Kansas, Missouri	896	903	984	91.8	512	11	18	281	25
District 2 total	3,233	3,320	3,873	85.7	1,842	27	97	864	223
Inland Texas	397	407	462	88.1	262	14	21	84	19
Texas gulf coast	[2] 2,444	[3] 2,556	3,296	77.5	1,115	24	110	728	125
Louisiana gulf coast	[2] 1,657	[3] 1,723	1,827	94.3	[4] 837	48	107	[5] 391	95
North Louisiana and Arkansas	144	150	177	84.7	58	5	----	37	12
New Mexico	48	49	55	89.1	25	5	1	12	3
District 3 total	[2] 4,690	[3] 4,885	5,817	84.0	[4] 2,297	96	239	[5] 1,252	254
District 4 total	422	465	503	92.4	229	4	12	122	36
District 5 total	1,744	1,825	2,264	80.6	876	43	150	261	292
Total United States									
Weeks ended:									
Jan. 18, 1974	[6] 11,425	11,901	14,109	84.4	5,921	183	536	2,986	962
Jan. 11, 1974	[2] 11,619	[3] 12,199	[7] 14,106	86.5	[4] 5,988	228	652	[5] 2,939	1,086
Jan. 19, 1973	12,134	([8])	[9] 13,396	90.6	6,115	193	706	2,903	1,044
Districts 1–4									
Jan. 18, 1974	9,681	10,076	11,845	85.1	5,045	140	386	2,725	670
Jan. 11, 1974	[2] 9,756	[3] 10,264	[7] 11,842	86.7	[4] 5,144	165	485	[5] 2,633	70_9
Jan. 19, 1973	10,272	([8])	[9] 11,219	91.6	5,298	102	542	2,645	70_7

[1] See p. 323 for production of aviation gasoline and kerosine.

[2] East coast from 1,222 to 1,215; District 1 from 1,401 to 1,394; Texas gulf from 2,467 to 2,433; Louisiana gulf from 1,654 to 1,638; District 3 from 4,718 to 4,668; Districts 1–4 from 9,813 to 9,756; total United States from 11,676 to 11,619.

[3] East coast from 1,277 to 1,270; District 1 from 1,457 to 1,450; Texas gulf from 2,652 to 2,618; Louisiana gulf from 1,749 to 1,733; District 3 from 5,014 to 4,964; Districts 1–4 from 10,321 to 10,264; total United States from 12,256 to 12,199.

[4] Louisiana gulf from 837 to 854; District 3 from 2,360 to 2,377; Districts 1–4 from 5,127 to 5,144; total United States from 5,971 to 5,988.

[5] Louisiana gulf from 422 to 405; District 3 from 1,247 to 1,230; Districts 1–4 from 2,650 to 2,633; total United States from 2.956 to 2.939.

[6] Includes 2,586[f] barrels of imported crude oil as follows: District 1—1,084[f]; District 2—601; District 3—244[f]; District 4—69; District 5—588.

[7] Based on new definition. [8] Not available. [9] Based on old definition.

STOCKS OF MAJOR REFINED PRODUCTS[1]

[In thousands of 42-gal barrels]

	Motor gasoline	Jet fuel (naphtha type)	Jet fuel (kerosine type)	Distillate fuel oil[2]	Residual fuel oil
East coast	50,251	154	5,337	72,729	21,528
Appalachia No. 1	5,342	63	205	3,795	714
District 1 total	55,593	217	5,542	76,524	22,242
Appalachia No. 2	3,372	26	205	2,698	269
Indiana, Illinois, Kentucky	36,999	297	3,745	29,937	6,066
Minnesota, Wisconsin, Dakotas	7,947	164	727	7,615	792
Oklahoma, Kansas, Montana	19,317	761	1,186	16,228	967
District 2 total	67,635	1,248	5,863	56,478	8,094
Inland Texas	8,405	317	1,075	2,976	325
Texas gulf coast	22,501	746	2,234	18,947	3,879
Louisiana gulf coast	[3] 10,756	664	1,423	[4] 9,642	2,193
North Louisiana and Arkansas	10,465	283	606	5,718	239
New Mexico	928	169	69	346	79
District 3 total	[3] 53,055	2,179	5,407	[4] 37,629	6,715
District 4 total	7,562	269	406	3,449	622
District 5 total	[3] 24,271	1,423	5,370	[4] 14,572	11,383
Total United States					
Weeks ended:					
Jan. 18, 1974	208,116	5,336	22,588	188,652	49,056
Jan. 11, 1974	[3] 205,933	6,123	23,571	[4] 194,115	52,165
Jan. 19, 1973	217,852	5,887	19,560	142,538	52,688
Districts 1–4					
Jan. 18, 1974	183,845	3,913	17,218	174,080	37,673
Jan. 11, 1974	[3] 182,242	4,599	18,314	[4] 180,005	39,945
Jan. 19, 1973	191,759	4,052	14,774	130,569	36,638

[1] See p. 323 for stocks of aviation gasoline, kerosine, and unfinished oils.
[2] Includes Grade No. 4 fuel oil.
[3] Louisiana gulf from 13,106 to 13,222; District 3 from 55,571 to 55,687; District 5 from 23,284 to 23,691; Districts 1–4 from 182,126 to 182,242; total United States from 205,410 to 205,933.
[4] Louisiana gulf from 8,138 to 8,023; District 3 from 35,777 to 35,662; District 5 from 14,078 to 14,110; Districts 1–4 from 180,120 to 180,005; total United States from 194,198 to 194,115.

PAD DISTRICT 1 BY GEOGRAPHIC AREAS

IMPORTS OF PETROLEUM PRODUCTS

[Daily average in thousands of 42-gal barrels]

Area [1]	Motor gasoline	Special naphtha	Jet fuel (naphtha type)	Jet fuel (kerosine type)	Kerosine	Distillate fuel oil	Grade No. 4 fuel oil	Residual fuel oil	Asphalt	L.P.G.	Petro-chemical feedstock	Unfin-ished oils	Plant con-densate	Total
New England	36			7	4	143	25	109						324
Central Atlantic	37		11	79		174	50	1,051		10		71		1,483
Lower Atlantic	33			4		10		391	28					466
Total Dictrict 1, weeks ended:														
Jan. 18, 1974	106		11	90	4	327	75	1,551	28	10		71		2,273
Jan. 11, 1974	34			97	3	101	96	1,638	30	10		65		2,074

[1] Described by the Bureau of Mines as follows: New England—Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut; Central Atlantic—New York, New Jersey, Pennsylvania, Delaware, Maryland, and D.C.; Lower Atlantic—Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida.

STOCKS OF PETROLEUM PRODUCTS

[Thousands of 42-gal barrels]

1. PRIMARY STOCKS REPORTED TO THE API

Area [1]	Motor Gasoline	Aviation gasoline	Jet fuel (naphtha type)	Jet fuel (kerosine type)	Kerosine	Distillate fuel oil [2]	Residual fuel oil	Unfinished oils
New England	6,168	97	33	652	1,548	16,991	3,049	420
Central Atlantic	28,921	304	164	2,198	4,048	47,400	15,702	13,255
Lower Atlantic	20,504	258	20	2,692	2,922	12,133	3,491	678
Total District 1, weeks ended:								
Jan. 18, 1974	55,593	659	217	5,542	8,518	76,524	22,242	14,353
Jan. 11, 1974	53,253	712	166	5,312	8,766	81,599	24,651	14,759

[1] Described by the Bureau of Mines as follows: New England—Maine, New Hamsphire, Vermont, Massachusetts, Rhode Island, and Connecticut; Central Atlantic—New York, New Jersey, Pensylvania, Delaware, Maryland, and the District of Columbia; Lower Atlantic—Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida.
[2] Includes grade No. 4 fuel oil.

PRODUCTION AND STOCKS OF SELECTED PRODUCTS

[Daily average production and stocks in thousands of 42-gal barrels]

	Production		Stocks		
	Aviation gasoline	Kerosine	Aviation gasoline	Kerosine	Unfinished oils
East coast			596	7,870	13,507
Appalachia No. 1		7	63	648	846
District 1 total		7	659	8,518	14,353
Appalachia No. 2		3		463	126
Indiana, Illinois, Kentucky		59	685	4,375	12,111
Minnesota, Wisconsin, Dakotas			89	1,048	516
Oklahoma, Kansas, Missouri	1		195	766	7,540
District 2 total	1	62	969	6,652	20,293
Inland Texas	1	4	272	177	1,855
Texas gulf coast	28	62	550	2,497	22,765
Louisiana gulf coast	3	60	573	1,653	9,031
North Louisiana and Arkansas		1	8	504	251
New Mexico		1	21	18	166
District 3 total	32	128	1,424	4,849	34,068
District 4 total		7	56	460	2,501
District 5 total	4	5	718	449	22,092
	Total United States				
Weeks ended:					
Jan. 18, 1974	37	209	3,826	20,928	93,307
Jan. 11, 1974	41	208	3,841	21,679	93,850
Jan. 19, 1973	34	253	4,029	16,619	91,151
	Districts 1–4				
Jan. 18, 1974	33	204	3,108	20,479	71,215
Jan. 11, 1974	32	205	3,143	21,203	71,219
Jan. 19, 1973	30	250	3,342	16,279	67,724

Note: The inventories shown above are located at refineries, bulk terminals, and in pipelines. These inventories include stocks unavailable for shipment, those available for current shipment, and those held in reserve for shipment during the high consuming season as a supplement to then current production. Unavailable stocks are those required for processing, held in tank bottoms, in pipeline fill, and in other equipment in order to assure continuous operations. Accordingly to studies by the National Petroleum Council, the unavailable portion of the industry's total inventories appear to vary seasonally between Sept. 30 and the following Mar. 31, about as follows: Finished gasoline 37 percent and 36 percent; kerosine 23 percent and 33 percent; distillate fuel oil 19 percent and 34 percent; residual fuel oil 16 percent and 36 percent.

ESTIMATED DOMESTIC PRODUCTION OF CRUDE OIL (INCLUDING CONDENSATE), IMPORTS, AND STOCKS OF CRUDE OIL

[In thousands of 42-gal barrels]

	Districts 1–4				District 5 (west coast)				Total United States			
	Daily average				Daily average				Daily average			
	Estimated domestic production [1]	Crude imports [2]		Crude stocks [4]	Estimated domestic production	Crude imports [2]		Crude stocks [4]	Estimated domestic production [1]	Crude imports [2]		Crude stocks [4]
		Total	From Canada [3]			Total	From Canada [3]			Total	From Canada [3]	
Week ended:												
Dec. 28, 1973	8,070	1,987	792	207,466	1,105	692	213	35,905	9,175	2,679	1,005	243,371
Jan. 4, 1974	8,019	2,035	576	205,869	1,110	556	213	33,683	9,129	2,591	789	239,552
Jan. 11, 1974	7,988	1,827	600	206,553	1,105	520	200	32,888	9,093	2,347	800	239,441
Jan. 18, 1974	8,047	1,895	696	201,823	1,105	276	157	28,995	9,152	2,171	853	230,818
4-weeks average:												
Jan. 18, 1974	8,031	1,936	666	----------	1,106	511	196	----------	9,137	2,447	862	----------
Jan. 19, 1973	8,198	1,906	652	----------	1,147	740	285	----------	9,345	2,646	937	----------

[1] Estimated domestic crude oil production by States is shown on p. 326.
[2] Imports of refined products are shown on p. 327.
[3] Included in total crude imports.
[4] Reflects stocks by State of origin rather than actual location.

STOCKS OF CRUDE OIL BY STATE OF ORIGIN

[Stocks and daily average change in thousands of 42-gal barrels]

State of origin	Week ended Jan. 18, 1974	Daily average change from Jan. 11, 1974
Pennsylvania grade	1,702	−11
Other Appalachian	466	+3
Lima-Michigan	890	−10
Illinois-Indiana	2,833	−7
Kansas	6,560	−70
Nebraska and North Dakota	1,698	−15
Oklahoma	11,963	−18
Arkansas	566	−4
Mississippi, Alabama, Florida	5,554	+48
Texas	85,419	−189
East Texas	7,034	+26
West Texas	48,093	−148
Gulf coast	13,118	−64
Panhandle	2,354	+2
North	7,146	−11
South	3,312	+20
Other	4,362	−14
Louisiana	30,426	−114
North	3,645	−30
South	26,781	−84
New Mexico	6,839	−54
Wyoming	14,347	+11
Other Rocky Mountain	8,586	−52
California (including Alaska)	20,752	−202
Foreign in District 5	8,243	−354
Other foreign	23,974	−194
Total crude stocks in United States	230,818	−1,232
Location of stocks:		
PAD District 1	18,624	−157
PAD District 2	66,875	−215
PAD District 3	102,408	−474
Louisiana and Texas gulf coast	39,995	−419
PAD District 4	14,045	+167
PAD District 5	28,866	−553

ESTIMATED DAILY AVERAGE PRODUCTION CRUDE OIL AND CONDENSATE

[In thousands of 42-gal. barrels]

	State crude oil allowable beginning Jan. 1, 1974	Estimated production week ended Jan. 18, 1974			Change from previous week	4 weeks ended Jan. 18, 1974	4 weeks ended Jan. 19, 1973
		Crude oil	Condensate	Crude and condensate			
*New York-Pennsylvania		13		13		13	12
Florida		92		92		91	70
*West Virginia		7		7		7	7
*Virginia		(1)		(1)		(1)	(1)
*Ohio-southeast		14		14		15	12
Ohio-other		6		6	+1	6	8
Indiana		14		14		14	17
Illinois		79		79		79	93
Kentucky		22		22		22	26
Michigan		40		40		40	39
Missouri-Tennessee		1		1		1	1
Nebraska		19		19	−1	20	27
Kansas	230	171		171	+1	177	193
Oklahoma	[2] 520	454	14	468	−24	494	518
North Dakota		55		55		55	56
South Dakota		1		1		1	1
Texas:							
District 1		57	3	60	+1	59	65
District 2		208	9	217	+2	215	217
District 3		[3] 483	[3] 24	507	+14	496	507
District 4		136	24	160		161	177
District 5		57	3	60	−2	62	58
District 6							
East Texas field		248		248	+7	243	242
Other		212	6	218	+6	215	213
District 7–B		100	1	101	+2	99	103
District 7–C		93	5	98	+2	96	99
District 8 and 8–A		1,811	25	1,836	+64	1,790	1,649
District 9		126	1	127	+1	126	127
District 10		58	5	63	+2	61	65
Total Texas	[4] 4,123	3,589	106	3,695	+99	3,623	3,522
North Louisiana		101	17	118		118	132
South Louisiana		[5] 1,768	[5] 246	2,014	−17	2,037	2,282
Total Louisiana	[6] 1,242	1,869	263	2,132	−17	2,155	2,414
Arkansas	54	51		51		51	51
Mississippi		153	1	154		154	165
Alabama		32		32		32	29
New Mexico—southeast	360	238	7	245		245	265
New Mexico—other		20	8	28		28	30
Wyoming		418		418		418	379
Montana		95		95		95	92
Colorado		106		106		106	98
Utah		89		89		89	73
Arizona		2		2		2	3
Nevada		(1)		(1)		(1)	(1)
California		909	1	910		910	947
Alaska		193		193		194	197
United States		8,752	400	9,152	+59	9,137	9,345
*Pennsylvania grade (incorporated above)		34		34		35	31

[1] Less than 500 barrels.
[2] Oklahoma Corporation Commission estimate of production in January 1974.
[3] Includes an estimate of production in the area subject to the regulations of the Federal Government as follows: Crude oil 2, condensate 1.
[4] Latest available allowable for Texas, as of Jan. 15, 1974.
[5] Includes an estimate of production in areas related to a line described by the Federal Government and subject to its regulations as follows; leases wholly seaward of the line, crude oil 828 , condensate 84; seaward portion of leases split by the line, crude oil 29, condensate 10; disputed area landward of the line, crude oil 83, condensate 4.
[6] Excludes area subject to the regulations of the Federal Government.

IMPORTS OF PETROLEUM PRODUCTS

[Daily average in thousands of 42-gal barrels]

	Motor gasoline	Special naphtha	Kerosine	Distillate fuel oil	Grade No. 4 fuel oil	Residual fuel oil	Jet fuel (naphtha type)	Jet fuel (kerosine type)	Asphalt	LPG	Petro-chemical feedstock	Unfinish-ed oils	Plant conden-sate	Total
Weeks ended:														
Districts 1–4:														
Dec. 14, 1973	24	----	29	216	97	1,690	----	107	21	100	----	112	114	2,510
Jan. 4, 1974	77	20	36	399	61	1,678	----	130	26	100	----	182	96	2,805
Jan. 11, 1974	76	----	3	133	96	1,660	----	113	30	97	----	93	75	2,376
Jan. 18, 1974	116	----	4	358	75	1,586	11	110	28	98	----	102	96	2,584
District 5:														
Dec. 28, 1973				10	----	117	7	63	----	14	----	40	6	257
Jan. 4, 1974				10	----	100	7	59	----	13	----	45	6	240
Jan. 11, 1974				10	----	119	7	62	----	12	----	20	6	236
Jan. 18, 1974				10	----	100	7	60	----	12	----	32	6	227
Total United States:														
Dec. 28, 1973	24	----	29	226	97	1,807	7	170	21	114	----	152	120	2,767
Jan. 4, 1974	77	20	36	409	61	1,778	7	189	26	113	----	227	102	3,045
Jan. 11, 1974	76	----	3	143	96	1,779	7	175	30	109	----	113	81	2,612
Jan. 18, 1974	116	----	4	368	75	1,686	18	170	28	110	----	134	102	2,811
4-weeks average ended:														
Districts 1–4:														
Jan. 18, 1974	73	5	18	277	82	1,654	3	115	26	99	----	122	95	2,569
Jan. 19, 1973	56	3	4	108	122	2,124	5	93	13	68	11	105	93	2,805
District 5:														
Jan. 18, 1974				10	----	109	7	61	----	13	----	34	6	240
Jan. 19, 1973		3				20	4	61	----	25	----	34	9	156
Total United States:														
Jan. 18, 1974	73	5	18	287	82	1,763	10	176	26	112	----	156	101	2,809
Jan. 19, 1973	56	6	4	108	122	2,144	9	154	13	93	11	139	102	2,961

GASOLINE CONSUMPTION BY STATES

[In thousands of gallons]

	Motor gasoline consumption						Total gasoline consumption		
	Total 8 months						Total 8 months		
	1973	1972	Percent change	August 1973	August 1972	Percent change	1973	1972	Percent change
Alabama	1,264,800	1,193,562	+6.0	177,156	163,603	+8.3	1,275,813	1,203,890	+6.0
Alaska	82,277	74,505	+10.4	11,760	12,516	−6.0	89,542	82,361	+8.7
Arizona	808,481	719,426	+12.4	106,004	99,267	+6.8	815,732	727,097	+12.2
Arkansas	776,860	740,168	+5.0	109,309	103,702	+5.4	784,198	747,667	+4.9
California	6,921,998	6,653,445	+4.0	931,166	899,651	+3.5	7,000,706	6,746,893	+3.8
Colorado	905,839	870,615	+4.0	123,295	128,778	−4.3	909,838	873,664	+4.1
Connecticut	891,444	867,654	+2.7	120,450	115,491	+4.3	914,715	883,132	+3.6
Delaware	202,731	189,689	+6.9	26,105	24,778	+5.4	205,282	191,752	+7.1
District of Columbia	167,734	151,688	+10.6	20,896	20,571	+1.6	174,935	158,895	+10.1
Florida	2,935,933	2,619,309	+12.1	384,028	333,284	+15.2	2,977,936	2,657,258	+12.1
Georgia	1,902,298	1,776,825	+7.1	260,953	243,297	+7.3	1,906,382	1,783,429	+6.9
Hawaii	176,651	167,117	+5.7	21,840	22,979	−5.0	181,651	177,324	+2.4
Idaho	313,824	301,416	+4.1	48,192	48,980	−1.6	323,245	309,037	+4.6
Illinois	3,357,005	3,176,190	+5.7	442,007	417,881	+5.8	3,366,948	3,185,830	+5.7
Indiana	1,914,284	1,816,402	+5.4	258,894	252,062	+2.7	1,927,132	1,838,765	+4.8
Iowa	1,219,731	1,068,923	+14.1	155,690	132,266	+17.7	1,234,758	1,082,158	+14.1
Kansas	866,539	945,487	−8.4	37,183	117,768	[1] −68.4	884,139	962,918	−8.2
Kentucky	1,139,835	1,086,402	+4.9	160,087	148,725	+7.6	1,147,183	1,091,496	+5.1
Louisiana	1,165,397	1,119,259	+4.1	156,034	160,253	−2.6	1,178,251	1,131,058	+4.2
Maine	361,621	345,174	+4.8	59,791	58,339	+2.5	368,813	350,112	+5.3
Maryland	1,237,506	1,179,767	+4.9	166,389	164,727	+1.0	1,244,232	1,186,615	+4.9
Massachusetts	1,580,702	1,503,222	+5.2	214,798	210,212	+2.2	1,591,432	1,513,323	+5.2
Michigan	3,161,474	3,014,099	+4.9	442,341	415,066	+6.6	3,185,615	3,040,115	+4.8
Minnesota	1,406,085	1,352,582	+4.0	204,484	198,273	+3.1	1,430,470	1,385,948	+3.2
Mississippi	816,915	791,683	+3.2	103,254	105,909	−2.5	821,761	793,146	+3.6
Missouri	1,778,299	1,740,141	+2.2	235,856	235,736	+.1	1,796,324	1,754,079	+2.4
Montana	308,150	277,968	+10.9	50,448	55,729	−9.5	332,868	300,195	+10.9
Nebraska	599,576	606,691	−1.2	74,678	86,869	−14.0	621,655	629,197	−1.2
Nevada	251,981	234,343	+7.5	38,073	36,830	+3.4	257,060	239,810	+7.2
New Hampshire	272,410	259,431	+5.0	42,251	41,222	+2.5	274,538	261,242	+5.1
New Jersey	2,175,713	2,116,944	+2.8	286,736	304,595	−5.9	2,186,697	2,129,208	+2.7

New Mexico	453,558	434,929	+4.3	59,005	64,757	−8.9	464,393	444,759	+4.4
New York	3,991,358	3,999,572	−.2	488,820	549,999	−11.1	4,020,852	4,018,131	+.1
North Carolina	1,891,603	1,795,569	+5.3	264,467	243,003	+8.8	1,931,766	1,830,724	+5.5
North Dakota	284,483	282,772	+.6	49,230	61,983	−20.6	289,919	287,894	+.7
Ohio	3,457,303	3,286,422	+5.2	465,199	453,840	+2.5	3,475,197	3,301,604	+5.3
Oklahoma	1,069,682	1,141,346	−6.3	147,173	128,649	+14.4	1,162,639	1,123,285	+3.5
Oregon	840,111	796,149	+5.5	121,557	117,787	+3.2	845,856	801,058	+5.6
Pennsylvania	3,225,417	3,107,123	+3.8	395,938	442,389	−10.5	3,251,593	3,137,803	+3.6
Rhode Island	270,779	266,787	+1.5	36,288	36,545	−.7	280,893	270,785	+3.7
South Carolina	989,333	938,942	[2] +5.4	140,833	135,959	[2] +3.6	997,265	943,642	[2] +5.7
South Dakota	305,953	295,632	+3.5	44,937	49,748	−9.7	309,959	299,537	+3.5
Tennessee	1,491,744	1,387,909	+7.5	215,587	180,474	+19.5	1,511,152	1,406,245	+7.5
Texas	4,545,631	4,619,381	−1.6	668,771	616,667	+8.4	4,670,201	4,733,908	−1.3
Utah	412,368	397,124	+3.8	59,560	59,679	−.2	471,413	461,834	+2.1
Vermont	165,532	160,435	+3.2	25,686	25,270	+1.6	165,980	160,999	+3.1
Virginia	1,583,888	1,441,708	+9.9	214,475	192,240	+11.6	1,763,232	1,599,334	+10.2
Washington	1,153,475	1,101,534	+4.7	164,284	162,747	+.9	1,159,002	1,102,193	+5.2
West Virginia	520,588	485,990	+7.1	70,492	68,807	+2.4	522,080	487,302	+7.1
Wisconsin	1,482,520	1,423,842	+4.1	216,512	210,696	+2.8	1,488,926	1,428,730	+4.2
Wyoming	199,830	192,319	+3.9	36,396	36,435	−.1	206,978	198,797	+4.1
Total United States	69,299,249	66,515,612	+4.2	9,355,358	9,197,033	+1.7	70,399,147	67,456,178	+4.4

[1] Due to the inconsistency of varying cutoff dates used by States' tax departments for tabulating a month's collections.

[2] The State of South Carolina revised as follows:

	September	October	November	December	Total
Motor gasoline consumption—					
1972: South Carolina	96,634	129,744	114,065	118,832	1,398,217
Total United States	8,334,091	8,658,601	8,118,643	8,571,918	100,069,623
Total gasoline consumption—					
1974: South Carolina	97,614	131,047	117,684	122,220	1,412,207
Total United States	8,460,478	8,826,785	8,240,722	8,701,391	101,685,554

Notes:

1. This tabulation presents a series of gasoline consumption by States showing a separation between total consumption (including use on highways and off highways, as well as sales to U.S. Government and aviation gasoline) and motor gasoline consumption excluding U.S. Government sales and aviation gasoline. As the data becomes available, this separation will be published monthly

2. The data shown in the above table is based upon returns made in accordance with the gasoline tax or inspection laws in the respective States.

GASOLINE CONSUMPTION

[In thousands of gallons]

	Motor gasoline consumption						Total gasoline consumption		
	Total 8 months						Total 8 months		
	1973	1972	Percent change	August 1973	August 1972	Percent change	1973	1972	Percent change
January 1973:									
South Carolina				110,009	101,691	+8.2	110,996	102,174	+8.6
Total United States				8,112,895	7,409,497	+9.5	8,246,898	7,535,133	+9.4
February 1973:									
South Carolina	213,173	206,637	+3.2	103,164	104,946	−1.7	215,149	207,832	+3.5
Total United States	15,914,116	14,891,443	+6.9	7,751,221	7,552,960	+2.6	16,105,896	15,150,788	+6.3
March 1973:									
South Carolina	333,535	322,638	+3.4	102,362	116,001	−11.8	336,501	324,407	+3.7
Total United States	24,275,057	22,852,984	+6.2	8,393,445	7,967,763	+5.3	24,650,207	23,251,454	+6.0
April 1973:									
South Carolina	452,751	434,101	+4.3	125,751	111,463	+12.8	462,425	435,870	+6.1
Total United States	32,607,824	30,832,525	+5.8	8,339,282	7,979,541	+4.5	33,130,414	31,356,773	+5.7
May 1973:									
South Carolina	588,320	553,855	+6.2	129,569	119,754	+8.2	593,120	556,239	+6.6
Total United States	41,710,891	39,608,349	+5.3	9,097,067	8,775,145	+3.7	42,372,499	40,269,276	+5.2
June 1973:									
South Carolina	714,251	677,000	+5.5	125,931	123,145	+2.3	720,065	680,070	+5.9
Total United States	50,750,056	48,389,073	+4.9	8,969,165	8,780,051	+2.2	51,488,977	49,183,181	+4.7
July 1973:									
South Carolina	848,500	802,983	+5.7	134,249	125,983	+6.6	855,286	806,868	+6.0
Total United States	59,944,250	57,180,357	+4.8	9,263,835	8,791,285	+5.4	60,900,652	58,109,989	+4.8

MOTOR GASOLINE CONSUMPTION

[In thousands of gallons]

	9 months					
	1973	1972	Percent change	September 1973	September 1972	Percent change
Total 45 States and District of Columbia [1]	74,817,446	71,661,964	+4.4	8,446,751	7,976,162	+5.9
Rhode Island	306,509	301,338	+1.7	35,730	34,551	+3.4
Total 46 States and District of Columbia	75,123,955	71,963,302	+4.4	8,482,481	8,010,713	+5.9
	10 months					
	1973	1972	Percent change	October 1973	October 1972	Percent change
Total 31 States [2]	[3] 54,337,115	51,774,296	+4.9	[3] 5,647,854	5,352,632	+5.5
District of Columbia	209,816	191,239	+9.7	20,651	20,053	+3.0
Maryland	1,546,152	1,477,694	+4.6	158,002	149,708	+5.5
North Carolina	2,366,606	2,258,665	+4.8	238,914	238,198	+.3
Pennsylvania	4,050,056	3,970,261	+2.0	426,936	466,957	−8.6
Rhode Island	343,493	333,561	+3.0	36,984	32,223	+14.8
Tennessee	1,882,975	1,751,412	+7.5	211,077	171,856	+22.8
Ohio	4,340,701	4,110,698	+5.6	451,665	426,481	+5.9
Total 37 States and District of Columbia	69,076,914	65,867,826	+4.9	7,192,083	6,858,108	+4.9

[1] State breakdown previously published in the Weekly Statistical Bulletin, vol. 55, No. 1 for week ended Jan. 4, 1974
[2] State breakdown previously published in the Weekly Statistical Bulletin, vol. 55, No. 2, for week ended Jan. 11, 1974
[3] The State of Michigan revised as follows:

Michigan	3,969,852	3,777,944	+5.1	421,704	391,237	+7.8

Note.—The data shown above is based upon reports made in accordance with gasoline tax or inspection laws in the respective States.

Mr. RIGG. The voluntary cutback in consumption I think has been one of the primary things that has helped us over this bad period. People have responded to the need to not have excess——

Chairman PROXMIRE. Now we are told the price is going to have to go higher. We are told the conservation measures are going to have to be sharper and the data that seems to be available seems to contradict that, seems to indicate that if we simply proceed on the basis we have in the last month or so that we will be in good shape.

Will you answer that.

Mr. RIGG. I don't think we will be in good shape. I haven't seen anything out of Mr. Simon's office of recent day but even though stocks are high, whether there will continue to be the leakage out of the embargo or not is a matter of conjecture.

Chairman PROXMIRE. Let me ask you this. The Interior Department contains the Office of Energy Conservation and the Office of Energy Data and Analysis?

Mr. RIGG. They are now over in Mr. Simon's office.

Chairman PROXMIRE. They did. Let me then ask you, I suppose, therefore, the recent estimate of fuel savings through voluntary conservation came at least in part from your Department.

Mr. RIGG. That is right.

Chairman PROXMIRE. The President said on Saturday that: "Gasoline consumption was down by 9 percent in December and that heating oil consumption also is much reduced." Can you tell us how these figures were arrived at?

Mr. RIGG. I cannot specifically give you those. Those are compilations of figures from the Bureau of Mines and the Office of Oil and Gas and various State agencies, associations such as API and others.

Mr. HODGES. Right.

Mr. RIGG. And then the Office of Energy Data and Analysis compiles those into a series of monographs and charts in which this was extrapolated.

Chairman PROXMIRE. When the president said 9 percent, he didn't say 10, round it out, he said 9 percent. I am wondering how precise and reliable and accurate that kind of estimate is.

Mr. RIGG. I would say reliability plus or minus 5 to 7 percent.

Chairman PROXMIRE. In other words, it could be down 4 percent or down 14 percent?

Mr. RIGG. No, no, I mean using 9 percent as 100 percent.

Chairman PROXMIRE. 8½ to 9½ percent?

Mr. RIGG. Yes, sir.

Chairman PROXMIRE. In your oral statement you say: "The Department's capacity to conduct analytical study is seriously limited."

Mr. RIGG. Yes, sir.

Chairman PROXMIRE. May I ask what, if anything, is now being done to alleviate that deficiency?

Mr. RIGG. We have recently instituted some additional computerization in the Bureau of Mines and also the U.S. Geological Survey has done the same thing. It is a matter of funds and people and this matter of adequacy of the information and ability to digest it to get a specialist, a man who has spent many years working with the data in energy and have a good staff with him so when they see a figure, the figure itself isn't important, it is what the significance of the figure is.

Chairman PROXMIRE. Have you ever requested more funding so you could get the additional personnel you need for this purpose?

Mr. RIGG. We have requested it.

Chairman PROXMIRE. And had it denied?

Mr. RIGG. Whenever we are denied funds it appears to me that we don't sell our need.

Chairman PROXMIRE. Well, I didn't ask that. It is not a philosophical question, it is a question of fact. Have you been denied funds?

Mr. RIGG. Certainly we have been denied funds in all——

Chairman PROXMIRE. For this particular purpose?

Mr. RIGG. For this particular purpose I don't think we have, this time around. We have gotten what we asked for this time.

Chairman PROXMIRE. You didn't ask for enough?

Mr. RIGG. We didn't ask for enough; we were going along——

Chairman PROXMIRE. Have you ever been denied?

Mr. RIGG. Yes.

Chairman PROXMIRE. When?

Mr. RIGG. Oh, 1 year or so ago, I believe, we were denied funds in the Department, but it wasn't an amount of denial that was significant at that time because there was no energy crisis at that time.

Chairman PROXMIRE. Mr. Hodges, I would like you to help us with this question of the shortage and the fact that Science maga-

zine and a responsible expert writing for the Washington Post has argued that there is not a shortage. How would you answer that.

Mr. HODGES. I answer it to this effect. There certainly is a shortage but a shortage is sometimes one of these flexible things a little difficult to define as to what we mean.

Chairman PROXMIRE. Let me ask, Mr. Hodges, I understand you are very careful in what you said you could provide. You provide data and information on the situation as it is and has been.

Mr. HODGES. Right.

Chairman PROXMIRE. You provide data on the reserves and production and so forth. You do not project, however.

Mr. HODGES. That is right.

Chairman PROXMIRE. Without projection how can you tell us whether there is a shortage or not, since we are talking about the situation as I understand it, not today, but the situation in the spring.

Mr. HODGES. Well, I am familiar with the Bureau of Mines data, for example, and I am generally familiar with many of these analysis that have been made by others, which is, of course, secondhand to me. I have not made a calculation as to what I think the shortage is today but there is an awful lot of evidence that points in that direction.

Chairman PROXMIRE. Would you deny that there is this assertion that the stocks are higher now than they were 1 year ago?

Mr. HODGES. That depends on the record. I am not sure I have them all. Motor gasoline I guess is down about maybe 10 million barrels.

Chairman PROXMIRE. Now that is based on what? Does that include the gasoline in inventories?

Mr. HODGES. This is stocks as reported by Bureau of Mines and the API. This is stocks in what we call primary storage, stocks in the hands of the refineries, it is stock in transient, it is stocks in the bulk terminals.

Chairman PROXMIRE. How about———

Mr. HODGES. This does not include the stocks that are in the hands of the wholesalers, distributors, and retailers.

Chairman PROXMIRE. How can we tell whether Mr. Rand is right or you are right?

Mr. HODGES. He doesn't have any better evidence than I have.

Chairman PROXMIRE. He is at least making an estimate on the total picture and you are giving us an estimate on part of the picture and saying on that basis that there is some shortage there but you don't know what the rest of the picture is.

Mr. HODGES. I am freely admitting that there is one gap in this that the Government needs under these circumstances and that is more information on secondary storage.

Coming back to the quotation about how much gasoline we saved by conservation and somebody says that is about 9 percent, I say I don't know how he found it out or how he made the calculation.

Chairman PROXMIRE. That was the President of the United States.

Mr. HODGES. I have heard an awful lot of statements that I don't necessarily believe, Mr. Chairman.

Chairman PROXMIRE. And you then would challenge that statement by President Nixon?

Mr. HODGES. I simply say I don't know.

Chairman PROXMIRE. You know as much about it as any man I can think of.

Mr. HODGES. Not in that precise sense because I do not have that data.

Chairman PROXMIRE. Well, didn't the API provide the data?

Mr. HODGES. They used our weekly statistical bulletin, somebody cranked it in, but I have not seen the analytical work, I don't know how they did it, but I would say I don't know how you can measure the impact of the conservation measures as of last week or 2 weeks ago.

Chairman PROXMIRE. Your response then would seem to suggest that this analysis may be largely guesswork?

Mr. HODGES. Yes.

Chairman PROXMIRE. Thank you. My time is up.

Congressman Conable.

Representative CONABLE. Thank you, Mr. Chairman. I am somewhat confused about how much information is available on imports of oil. Do you feel, Mr. Hodges, you have accurate enough information about that?

Mr. HODGES. I would say, and I have told the staff of the GAO that has been making this study, and incidentally I would like to say we have been cooperating fully with staffs from Congress and all sorts of agencies—I have pointed out that information on imports is a mushy area. I do not think it is an API problem, I think it is a Government problem. It lies between the census and customs and I personally have not audited it but I know we have problems in this area.

Representative CONABLE. For instance, do you have any current information from which we could figure out during this past year what percentage of our petroleum needs have been met by imports?

Mr. HODGES. Well, we don't have the official record yet but I am sure it is going to run in the neighborhood of 35 percent of our total domestic demand.

Representative CONABLE. So a very substantial part of our oil consumption in this country is dependent on a resource which you describe as mushy in terms of availability of statistics? At least 1 out of each 3 gallons or barrels consumed in this country is coming from abroad.

Mr. HODGES. All of these statements necessarily require infinite explanation. By the time the year is over, for example, fiscal year 1972, I think we will have pretty good data because by then the Bureau of Mines and Census have done an awful lot of reconciliation. I don't know whether it is off by 5 percent or 2 percent, but I was speaking, when I made the statement, it is on a month-by-month basis where there is a delay in the paper flow, and sometimes the stuff goes up the line and it gets kicked back, it may not be reported in the proper month. It is partly a matter of timing, partly reporting, partly definition, but I am reasonably confident that once the

Bureau of Mines has balanced all of these data out that we have a good picture of what happened in 1973.

Representative CONABLE. Many of your member companies are international oil companies. Do you have different requirements with respect to their foreign reserves and with respect to their American reserves.

Mr. HODGES. We do not get involved with any foreign activities whatsoever.

Representative CONABLE. So you feel that is not appropriate for the American Petroleum Institute?

Mr. HODGES. That has been the American Petroleum Institute's policy long before I came here.

Representative CONABLE. Now, Mr. Rigg, do you feel that we have an adequate lever on an international oil company, ownership of which is sited in this country, so that we can get information about foreign reserves and their relationship to the probable supply of oil in this country?

Mr. RIGG. I would say that I do not believe we have adequate capability of retrieving this information, of assessing its validity.

Representative CONABLE. Do we have the legal authority to do it?

Mr. RIGG. We do when it comes across the border, when the Customs have the authority to find the amounts, but as far as what their reserves are in the various countries, I know of no authority that would require the companies to submit that to the Department.

Representative CONABLE. Do you see any possible difficulty with trying to improve our information in this way? Is it possible that pressure to do so, to determine the extent of foreign reserve, might result in some possible loss of some access to those reserves for our country.

Mr. RIGG. This could happen. The accumulation of this foreign data is done by the State Department who attempts in the various countries to get any information that they can make available to us for our use and sometimes the countries do not even make this information available to them. Other times it is available a year or two late. So a lot of the information is not up to date.

Representative CONABLE. So as we become increasingly dependent on imported oil it is quite obvious our statistical basis is going to become mushier and mushier, isn't that correct?

Mr. RIGG. That is correct.

Representative CONABLE. And this probably is going to be a greater problem than the accuracy of our identification of American reserves which, in fact, are going to dwindle in importance in relation to our total available resources; isn't that correct?

Mr. RIGG. Well, we have tremendous resources domestically here that we could make available for utilization and "Project Independence" addresses itself to that problem.

Representative CONABLE. Well, let me ask you this. Mr. Hodges gave us apparently a detailed description of the oil reserves, how these reserves are determined. Now, these reserves are going to differ in their accessability and availability depending on the price of crude oil at the wellhead, are they not?

What is an appropriate reserve at one price may not be an appropriate reserve at another price?

Mr. RIGG. That is correct.

Representative CONABLE. Simply because it isn't economically feasible to recapture the greater amount at the lower price. Ralph Nader told us that oil reserves should be pegged at a level of up to 10 times the level used in policy planning during the recent past because the economic conditions, price, affect the proven reserve level.

Now, is that an accurate fact?

Mr. RIGG. I don't know that I would agree with Mr. Nader that it should be pegged 10 times higher.

Representative CONABLE. Well, really economic feasibility has changed dramatically, has it not, because of the changes in prices that have already occurred?

Mr. RIGG. That is right. There is a function of both price and technology involved and either one or a combination of both can change the reserve and the resources figures. The careful analysis of the information though must be based on the fact that what one good technical man will say is a reserve another one will disagree.

Representative CONABLE. Do we have the capacity to adjust these reserve figures on the basis of economic feasibility?

Mr. RIGG. We have the competence. Whether we have the capacity or not I would question under our current levels.

Representative CONABLE. Well, is that a possible source of disagreement about what reserves are available to us now?

Mr. RIGG. Yes, that is true.

Representative CONABLE. And once we understand that there must be some way of converting and of recapturing an accuracy which many people feel has been lost because of the statistics being based on conditions of, let's say, a year ago in the price field.

Isn't that correct?

Mr. RIGG. That is right.

Representative CONABLE. Well, I hope we can. You know it is very difficult for us to analyze these statistics as laymen and see what we are talking about and why there is so much disagreement with it, and that is one of the things this committee is trying to ascertain.

Now, Mr. Shiskin, you say in your statement that you have no legal authority to compel companies to report price data to the Bureau of Labor Statistics?

Mr. SHISKIN. That is correct.

Representative CONABLE. Under the Economic Stabilization Act dosen't the President have the authority to do that?

Mr. SHISKIN. Well, maybe. I don't know. The Cost of Living Council can get data from the companies but they are not available to the BLS.

Representative CONABLE. They are not available to you?

Mr. SHISKIN. No, sir.

Representative CONABLE. So the authority, if it is there, doesn't attach to you as a statistical gathering agency?

Mr. SHISKIN. Right.

Representative CONABLE. Do you see any problems in the release of proprietary information if you ask the petroleum companies to report price data to the Bureau of Labor Statistics?

Mr. SHISKIN. The Bureau of Labor Statistics has a great tradition of maintaining confidentiality of reports. I am very hopefull

that we will before long have a new law which will strengthen the confidentiality provisions of data reported to the BLS. Under those conditions I think the reports to the BLS should be made mandatory.

Representative CONABLE. You point out at one point in your statement that oil companies are not convinced the existing data provided voluntarily is inadequate and you go on to imply this is one reason why you are having trouble getting voluntary compliance with a more up to date reporting system.

I wonder if you could explain in a little greater detail what the differences of opinion are that seem to be preventing this greater voluntary compliance?

Mr. SHISKIN. Yes; as I understand it, now, I am fairly new to BLS and I may not get this precise, but I think the essence of it will be there. In the past the BLS policy was, as it is today, to collect data directly from companies. Now BLS tries to collect price data from companies. However, the companies were reluctant to give it and they explained as their reason that the price quotations that were publicly available were satisfactory for this purpose.

Now that may have been true in the past but it is very doubtful that it is true today.

If you will look at the chart I provide—in my prepared statement —you will see that there is now a very large gap between the movements of the WPI and CPI, whereas in the past these two indicators moved together.

Representative CONABLE. Yes.

Mr. SHISKIN. The point I made is that it seems to me as an experienced statistician you can't take shortcuts like that, you never should. You should always stay with the basic principles of collecting data from the respondent. Now, we deviated from that principle and I think we are paying a price today.

Representative CONABLE. Mr. Hodges, do you have any comments?

Mr. HODGES. I believe I should comment on this. In the first place, for legal reasons, our attorneys feel that we should not get involved in discussions of prices in any way. But with regard to the comment Mr. Shiskin has just made, and since you are new I hope you understand I may have a little more current information—I believe the companies, I cannot speak for them, but there is evidence that they understand that the sources of data used by BLS are not adequate.

Now, to what extent this is spread around and how much agreement we would find I do not know, I believe there has been a change of attitude on that or change of understanding.

Now, there are perhaps some proprietary problems I certainly cannot speak to.

Some of the problems that BLS encountered, however, involve some definitional problems that were very difficult for the companies to conform to and there were also problems of collecting data in the regional format required by BLS.

So there is a lot more to the story, I believe, than just reluctance to report.

Representative CONABLE. That is all, Mr. Chairman.

Chairman PROXMIRE. I would like to followup, Mr. Hodges, on the question that Mr. Conable was addressing to Mr. Rigg, because

you think this is absolutely fundamental in determining what our reserves are.

You say in your prepared statement:

Proved reserves as of any given date are the estimated quantities of all liquids statistically defined as crude oil, which geological and engineering data demonstrate with reasonable certainty to be recoverable in future years from known reservoirs under existing economic and operating conditions.

Now obviously if you have a $3.25 or $3.85 or $4.25 or $5.25 price it has an enormous bearing on how big your reserves are. They are far lower when the price is low and substantially higher when the price is high. Mr. Nader may or may not be right. It may be 50 percent more, 100 percent more. It seems to me when you have this kind of sharp increase in price it has a pro[illegible]l effect, immediate effect, which many of us haven't grasped on [illegible]ze of oil reserves and we have had, as indicated, a very big increase in price already.

Is there any way that we can tell, do you have any statistics, any data, any information that would indicate what the present economic conditions would warrant in terms of the impact on reserves?

Mr. HODGES. This would involve speculation on my part and prejudgment of what the Reserves Committee will determine about March 20 when all of the figures from the country are brought together and added up.

Chairman PROXMIRE. When are they going to do this?

Mr. HODGES. March 20, thereabouts.

Chairman PROXMIRE. What will they come forth with at the time, they will give a new estimate?

Mr. HODGES. A new estimate of reserves as of December 31, 1973.

Chairman PROXMIRE. And the last estimate of the reserves are what?

Mr. HODGES. 30-odd some. I didn't bring my report. I have a reserves expert in the audience if you want to pursue this.

Representative CONABLE. May I ask something here?

You know, we are assuming, of course, that if economic feasibility permits the recovery of more from existing pools of oil that that can be done in a reasonable period of time. I have to ask you isn't secondary and tertiary recovery not only more expensive but doesn't it require different techniques and, therefore, aren't many of these additional reserves that we might eventually be able to recover substantially off in the future? Aren't we without the capacity to realize them in a short period of time?

Mr. HODGES. Well, with respect to the tertiary, what I understand, again I will allow the expert to answer more definitively, these are the most esoteric methods that perhaps have not been proved commercially and they certainly are in the future.

Now, water flooding and things of this sort are real and if the increase in price justifies the installation I would assume that we will see some indicated additional reserves taken out of one column and plugged into the proved reserves, but I have no data, Mr. Chairman, I do not make these calculations.

Chairman PROXMIRE. The reason I asked that is, of course, next March, I know that it is a short time, when you consider how tech-

nically difficult this is and the kind of responsibilities you should have in this kind of estimate, but at the same time in terms of this energy crisis and the policies we should follow and whether we have rationing or whether we don't, and so forth it is quite a long time.

Mr. HODGES. Well, I agree.

Chairman PROXMIRE. And I would wonder if we could get just some kind of ball park notion of what we are talking about if the tenfold is too big, is it within, say a 100 percent increase?

Let me follow up. What was the date on which the current estimates of reserves was based?

Mr. HODGES. The one available now?

Chairman PROXMIRE. Yes. What were the prices.

Mr. HODGES. What price?

Chairman PROXMIRE. Based on the $3.25 price.

Mr. HODGES. Whatever it was last December 31.

Chairman PROXMIRE. December 31, 1972?

Mr. HODGES. That is right.

Chairman PROXMIRE. You do this once a year?

Mr. HODGES. Yes.

Chairman PROXMIRE. That was about $3.25, was it not, something like that? You said you have an expert who can tell us how big the reserve is now.

Mr. HODGES. He can talk about procedures and what it was as of December 31, 1972. We do not have any numbers for Dec. 31, 1973. The men are in the field, they are working on it right now. The first returns will start coming into my office around February 15. They are not due until March 1.

Chairman PROXMIRE. Can he tell how many billion barrels we had in reserve as of last year?

Mr. HODGES. This is John Drisdale of Texaco, Mr. Chairman. On December 31, 1972, it was 36.3 billion barrels.

Chairman PROXMIRE. What is that?

Mr. HODGES. 36.3 billion barrels.

Chairman PROXMIRE. 36.3 billion barrels?

Mr. HODGES. That is right.

Chairman PROXMIRE. That is as of December 31, 1972?

Mr. HODGES. That is right.

Chairman PROXMIRE. Do you have any experience that could tell us what has been the result when the price has gone up in the past?

Mr. HODGES. That was before my time, until this recent round, I guess. Mr. Drisdale, do you care to comment on that?

Mr. DRISDALE. Only to the effect that the recent price increases will enable industry to go into the innovative, creative procedures to recover more oil that previously were not economical. We will be able to now afford field trial tertiary recovery processes.

Chairman PROXMIRE. Of course, we know that. What I am trying to pin down, if I can, is some notion, some overall estimate that we can get, and I realize you gentlemen are not going to give a precise estimate. Just give us some notion of whether or not this will enable us to double our estimates of the amount of reserves or increase them 50 percent or by what proportion, roughly.

Mr. HODGES. I will say, first, I do not believe there have been any studies made to my knowledge where we have tried to determine—I am not sure whether we should call this supply elasticity or reserve elasticity, in response to an increase in price. I am not aware of any study.

Chairman PROXMIRE. Why should not the API be very interested in that? Was that not the principal reason or a principal reason for the tremendous burden on the American consumer, a classical increase in price that we had in December, for example, $4.25 to $5.25? I would think it would have to be based on some notion of what this would do. If it would not increase supply significantly, I think it is very hard to justify. If it would increase supply significantly then I think you have a strong argument for it. But we would like to know how much it increased it, how much of an estimate they had had.

Mr. HODGES. The basic thread of the thought, I would think, has been that with higher prices that you are going to improve the incentive for drilling, and that is where you really get your reserves. I do not know that we have had any experience of what price does to these kinds of estimates.

Chairman PROXMIRE. The Cost of Living Council made this decision, this profoundly important and costly price decision without any knowledge of how this would affect reserves?

Mr. HODGES. I was not present and I do not know what knowledge they had or what information they used.

Chairman PROXMIRE. When the executive committees get together, the executive committee gets together to decide on what the reserves will be, these are oil industry executives?

Mr. HODGES. These are engineers, geologists, reservoir——

Chairman PROXMIRE. They all work for oil companies?

Mr. HODGES. Most of them. There are one or two exceptions. We have a State geologist as chairman of one of the subcommittees.

Chairman PROXMIRE. They will make their estimates which will then be accepted.

Is there any way to get behind this? Supposing there is an understandable tendency, since these are industry people, to underestimate the reserves, which if you did so might result in a further price increase. How could you get behind this to determine its integrity and accuracy, or is there a way?

Mr. HODGES. I will have to say this. That the industry is painfully aware that they have spent hours and tons of money doing this on a voluntary basis and they are aware of the credibility problem, Mr. Chairman. We started last year with a top level committee to try to close the gap between industry and Government to see what could be done. For various reasons that effort did not come out with an answer. I strongly suspect it was because there was a certain amount of chaos in Government and they did not have many people to talk with. They would talk to one person one day and he was not there the next. We are again trying to come to grips with this problem. I cannot make an official statement of what we would propose because it has not been settled. I hope certainly that industry leaders will be

talking with Government and that we can find a way to close this credibility gap.

Chairman PROXMIRE. Mr. Rigg, in your prepared statement you said, and I quote: "U.S. Government information base for the conduct of its mineral responsibilitis is grossly inadequate."

Mr. RIGG. That is right.

Chairman PROXMIRE. Who is responsible for this over the years, the Congress, the Interior Department, past Presidents, or the present administration or who?

Mr. RIGG. I think it is the same persons that you can put the energy crisis on, every one of us. I think we are all to blame. I think we are all to blame because we felt basically that we had plenty of energy resources available and we had stable supplies. The Secretary, in his report that I referred to, pointed out that the shortfall as one of the points in that report that he sent to Congress last year, and that statement is out of his report.

Chairman PROXMIRE. Well, let me see if I can pin it down a little. Earlier you said there was a denial of your agency's request for additional funds to upgrade your analytical capability.

First, I would like you to provide for the record, within 10 days, details showing how much money has been requested of Congress specifically to upgrade the Interior Department's analytical and factfinding capability with regard to energy resources for each of the past 5 years.

Second, you said the denial of the request for funds last year was not significant because there was no energy crisis a year ago, yet in your prepared statement you say the approach of the energy crisis has been clearly evident and the Interior Department has been warning about it for many years.

Mr. RIGG. That is correct.

Chairman PROXMIRE. How do you reconcile your oral response to your prepared statement? At one point you have said, "There was no energy crisis last year" and then you say you, "Have been warning about an energy crisis for years."

Mr. RIGG. The energy crisis really did not happen until we had a shutoff from insecure foreign sources. Up to this time we pointed out to the Congress and to the people that dependency on unsecured foreign sources is a matter of concern.

Chairman PROXMIRE. All right, if it is a matter of concern, why should you not have been pressing, and since the data would be inadequate under those circumstances, why were you not pressing for more funds so you could get more competent analytical capability and so you could gather data that would be more reliable and more far-reaching and comprehensive?

Mr. RIGG. We were pushing forward but we were not pushing forward with the intensity we obviously should have been doing nor had anyone else pushed us to make us get the data.

Chairman PROXMIRE. Will you give us what funds your agency requested that were denied by Interior or OMB before the budget went to Congress?

Mr. RIGG. Yes, sir.

[The following information was subsequently supplied for the record:]

BUREAU OF MINES—COMPARISON OF BUDGET REQUESTS WITH ALLOWANCES AND APPROPRIATIONS—DATA COLLECTION AND ANALYSIS

[In thousands of dollars]

	Bureau of mines request	Departmental allowance	OMB allowance	Appropriation
Fiscal year:				
1970	7,540	7,540	7,540	7,540
1971	8,473	8,473	8,268	8,268
1972	10,018	10,018	9,018	9,018
1973	10,571	10,571	9,571	9,571
1974	9,263	9,263	9,263	10,763

BUREAU OF LAND MANAGEMENT—ENERGY DATA COLLECTION AND ANALYSIS

[In thousands of dollars]

	Bureau request/ Department allowance	OMB allowance	Supplemental	Congressional appropriation
Fiscal year:				
(1969 base)	(2,529)	(2,529)	----------	(2,529)
1970	2,994	3,114	----------	3,114
1971	3,209	3,209	----------	3,209
1972	3,209	3,209	180	3,389
1973[1]	5,824	4,964	----------	4,964
1974[1]	8,739	8,114	1,250	9,364

[1] Includes funds for land-use planning in energy resource areas. Also includes funds for oil shale title clearance, environmental assessment efforts for the Outer Continental Shelf leasing program, and preparation and review of environmental analyses and impact statements on proposed energy leasing activities.

U.S. GEOLOGICAL SURVEY—ENERGY ACTIVITIES (ANALYTIC AND FACTFINDING), JAN. 31, 1974

	Fiscal year—				
	1970	1971	1972	1973	1974
Request to OMB	$5,732,000	$5,947,000	$5,328,000	$15,191,000	$15,260,000
Request to Congress	4,209,000	4,237,000	5,210,000	12,420,000	15,630,000
Appropriation	3,909,000	4,713,000	6,783,000	12,514,000	15,930,000
(Total USGS Appropriation)	(102,020,000)	(114,603,000)	(131,050,000)	(150,450,000)	(161,382,000)

Chairman PROXMIRE. You said in your prepared statement that the freezes kept personnel below strength.

Mr. RIGG. That is right.

Chairman PROXMIRE. What effect did that have on your capability?

Mr. RIGG. Well, it had the effect of inadequate numbers of highly competent people to analyze the data. We have a lot of data that we do not even get to utilize.

Chairman PROXMIRE. You indicated that we did not have a crisis last year, we do have a crisis this year. Most people have told us, including Mr. Simon, that the end of the embargo will not be the end of our crisis.

Was Mr. Simon wrong, in your view, once the embargo is over, is that it?

Mr. RIGG. No, I think it will continue and whether it will continue and whether it will be of a higher magnitude than it is today I do not know; I cannot look in the future and give you an honest answer on that, Mr. Chairman.

Chairman PROXMIRE. In your prepared statement you discuss the difficulties you had and say it is particularly difficult to meet EPA requirements.

Mr. RIGG. Yes, sir.

Chairman PROXMIRE. Environmental policy requirements?

Mr. RIGG. Yes, sir.

Chairman PROXMIRE. How and why and to what extent?

Mr. RIGG. Well, they also want to have more information to look to alternative sources to when you are looking, for instance, at a siting of a powerplant or the development of a resource, they want to look at alternate sources. They also want to look at the effect on the air standards, the effect on the ambient air by the discharges of various processes using energy. These are difficult to come by. Many times and one of our——

Chairman PROXMIRE. Difficult in what way, they are costly?

Mr. RIGG. Not only costly but they are technologically difficult. We know that of the more than 92 elements that are present in major minerals, if there is an inadequate amount there are certain effects on biological systems and on plants and on the humans, and if there is too much there are certain effects, but we do not know with a degree of accuracy that it is comfortable, what the ranges are of these concentrations, so when EPA wants to know what the effect is of a certain concentration of SO_x or NO_x we do not have that data.

Chairman PROXMIRE. You say it is more than a matter of cost; it is a matter of technological competence?

Mr. RIGG. That is right.

Chairman PROXMIRE. To many of us this is so important, satisfying the environmental question, that I think we would be willing to provide more funds if that would be the answer.

I would like to have you, for the record, if you could, answer this a little more detailed, indicate what competence you need and where the funding has been inadequate.

Mr. RIGG. We will be delighted to do so.

[The following information was subsequently supplied for the record:]

We believe that the greatest deficieincies in our part of the Federal Government's energy resource fact-finding and analytic capability are in the areas of resource appraisal, resources evaluation and environmental data and analysis. Our FY 1975 budget proposals provide for significant and necessary funding and positions in these very areas of inadequacy.

Chairman PROXMIRE. You say in your prepared statement, "The report recommended several corrective governmental policy actions, some of which have been taken under stimulus of the Arabian oil embargo," indicating other recommended corrective actions that have never been taken. What actions were those?

Mr. RIGG. Mr. Morgan of the Bureau of Mines, I would like to have him come up and bring a copy of his report for you, Mr. Chairman.

Chairman PROXMIRE. My question really is, Mr. Rigg, what significant corrective governmental policy actions have not been taken? We have been remiss in enacting them?

Mr. RIGG. This report dated June 1973, the Second Annual Report of the Secretary of the Interior, on page 5, we have a series of recommendations to improve the development of domestic resources and to provide more responsive administrative mechanisms. These include the formation of the Department of Energy and Natural Resources, and providing an Organic Act for the Bureau of Land Management. The only one that has happened is to modify the right-of-way limitation, that was on the Alaskan pipeline bill. Also included were: Revision of the mineral leasing laws, regulation of surface mining activity, amending the Natural Gas Act, facilitating development of deepwater ports, and encouraging domestic production. Additionally, the Treasury Department proposed tax changes to encourage oil explorations. We should develop ways to stimulate maximum cooperation among industry. Government, and academia. We should expand our cooperation in resources.

Chairman PROXMIRE. For the record, will you refer to the pages and so forth and provide the report so we can check that out?

Mr. RIGG. We will do so.

[The report was subsequently supplied for the record:]

[See pages 5 and 73 of the report]

MINING AND MINERALS POLICY

1973

Second Annual Report of the Secretary of the Interior

under the Mining and Minerals Policy Act of 1970

(P.L. 91-631)

June 1973

Library of Congress Catalog-Card No. 72-622941

Public Law 91-631
91st Congress, S. 719
December 31, 1970

An Act

84 STAT. 1876

To establish a national mining and minerals policy.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Mining and Minerals Policy Act of 1970". Mining and Minerals Policy Act of 1970.

SEC. 2. The Congress declares that it is the continuing policy of the Federal Government in the national interest to foster and encourage private enterprise in (1) the development of economically sound and stable domestic mining, minerals, metal and mineral reclamation industries, (2) the orderly and economic development of domestic mineral resources, reserves, and reclamation of metals and minerals to help assure satisfaction of industrial, security and environmental needs, (3) mining, mineral, and metallurgical research, including the use and recycling of scrap to promote the wise and efficient use of our natural and reclaimable mineral resources, and (4) the study and development of methods for the disposal, control, and reclamation of mineral waste products, and the reclamation of mined land, so as to lessen any adverse impact of mineral extraction and processing upon the physical environment that may result from mining or mineral activities.

For the purpose of this Act "minerals" shall include all minerals and mineral fuels including oil, gas, coal, oil shale and uranium. "Minerals."

It shall be the responsibility of the Secretary of the Interior to carry out this policy when exercising his authority under such programs as may be authorized by law other than this Act. For this purpose the Secretary of the Interior shall include in his annual report to the Congress a report on the state of the domestic mining, minerals, and mineral reclamation industries, including a statement of the trend in utilization and depletion of these resources, together with such recommendations for legislative programs as may be necessary to implement the policy of this Act. Report to Congress.

Approved December 31, 1970.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 91-1442 (Comm. on Interior and Insular Affairs).
SENATE REPORT No. 91-390 (Comm. on Interior and Insular Affairs).
CONGRESSIONAL RECORD:
Vol. 115 (1969): Sept. 5, considered and passed Senate.
Vol. 116 (1970): Sept. 21, considered and passed House, amended. Oct. 14, Dec. 18, Senate concurred in House amendments.

FOREWORD

Energy and minerals are the lifeblood of our industrial economy. Recently the President reaffirmed his concern about energy in his messages of April 18 and June 29, 1973, and he has also expressed concern about our natural resources and environment in his message of February 15, 1973.

The Mining and Minerals Policy Act of 1970 requires that I make an Annual Report to the Congress on the state of the domestic mining, minerals, and mineral reclamation industries. It is submitted herewith.

Development of our domestic resources is not keeping pace with needs. The Executive Summary which follows presents a concise estimate of the current situation, together with recommendations for major actions intended to improve our national mineral posture.

Rogers C.B. Morton

ROGERS C.B. MORTON
SECRETARY OF THE INTERIOR

37-143 O - 74 - 23

TABLE OF CONTENTS

	Page
Public Law 91-631 - "The Mining And Minerals Policy Act Of 1970"	ii
Foreword	iii
Executive Summary, Including Recommendations	1
The State Of The Domestic Mining, Minerals, And Mineral Reclamation Industries	7
Minerals And Elements	9
Exploration	11
Mining	13
Moving Bulk Minerals	15
Processed Minerals And Energy	17
Mineral Uses	19
Mineral Reclamation	21
Mineral Imports	23
Global Perspective	25
Role of Minerals	27
Energy	29
Petroleum And Natural Gas	37
Coal And Uranium	39
Ferrous Metals	41
Major Nonferrous Metals	43
Plastics	45
Nonmetallic Construction Materials	47
Fertilizer Materials	49
A Look To The Future	51
Reserves And Resources	53
Major Problems Which Presently Confront The Mining, Minerals, Metal, Mineral Reclamation, And Energy Industries, And The U.S. Government	55
Mineral Balance of Trade	57
Expropriations, Confiscations, Etc.	59
Foreign And Supranational Activities	61
Transportation	63
Disturbing The Earth	65
Financing Needed Expansion	67
Public Land Management	69
Need For Improved Environmental Data	71
Inadequate Information Base	73

LIST OF FIGURES AND TABLES

Figures		Page
1	Old Scrap Recycled In The U.S. Is Significant But Improvement is Possible.	20
2	Imports Supplied Significant Percentage Of Total U.S. Demand In 1972	22
3	U.S. Production Is Falling Behind In Relation To The Rest Of The World	24
4	The Role Of Minerals In The U.S. Economy . . .	26
5	U.S. Demand For Major Energy Sources	30
6	Consumption Of Energy By Sources (1972). . . .	30
7	Sulfur Emission Regulations Are Forcing Major Changes In Costs And Sources Of Fuels For Electric Power Generation	32
8	U.S. Supplies And Uses Of Petroleum	36
9	U.S. Supplies And Uses Of Natural Gas	36
10	U.S. Supplies And Uses Of Coal	38
11	U.S. Supplies And Uses Of Uranium (U_3O_8) . . .	38
12	U.S. Supplies And Uses Of Iron	40
13	U.S. Production Of Raw Steel By Furnance Type	40
14	U.S. Supplies And Uses Of Major Nonferrous Metals	42
15	U.S. Supplies And Uses Of Plastics	44
16	U.S. Supplies And Uses Of Major Nonmetallic Construction Materials	46
17	U.S. Supplies And Uses Of Major Fertilizers .	48
18	Developing Deficits - U.S. Primary Mineral Demand vs. U.S. Primary Mineral Supplies . .	50
19	Mineral Resource Diagram	52
20	U.S. Imports Exceed Exports Of Raw And Processed Minerals	56
21	Minerals Are Major Transportation Users . . .	62
22	Over The Past Decade, Steel, Copper, Chemicals, And Cement Stock Prices Have Lagged The Standard & Poor's "500" Index	66

Table		
1	Resources Of Selected Mineral Commodities . . .	54

EXECUTIVE SUMMARY, INCLUDING RECOMMENDATIONS

Mining and agriculture are the fundamental industries that convert natural resources into useable forms. The output of our mining, minerals, metal, mineral reclamation, and energy industries was valued at more than $150 billion in 1972. Over 4 billion tons--40,000 pounds per person--of new mineral supplies are needed annually in our economy. Our use of energy is equivalent to 300 persons working around-the-clock for each one of our citizens.

As we assess our current position we must keep in mind that our population of 210 million is but 6% of the world's population, and our 3 1/2 million square miles are but 6% of the world's land area. The other 94% of the people on earth also want significantly improved living standards, and worldwide demand for energy and minerals is rising rapidly.

Fortunately, our land areas, plus the continental shelves and seabeds appertaining thereto, are one of the largest areas under the sovereign control of any one nation, and they contain vast mineral resources.

However, despite our vast natural resources, we find increasing evidence that development of domestic mineral resources is not keeping pace with domestic demand, with consequent unfortunate effects upon the entire economy. For example:

* * Domestic exploration in 1972 continued its downward trend.
* * Some forms of energy have been in short supply.

* * Even with present domestic oil wells producing at full capacity, we imported 29 percent of our petroleum in 1972.
* * Domestic petroleum refining capacity is less than adequate to meet current demand and we import refined petroleum products.
* * Over 17 million tons of steel were imported in 1972.
* * We had a deficit of $6 billion in the U.S. mineral balance of trade in 1972.

We are encountering greater difficulty and higher costs in acquiring mineral raw materials in foreign areas and we are also encountering greater difficulty in world markets in selling many manufactured articles.

Comparing forecast future U.S. demand trends with U.S. mineral production trends of the past two decades indicates that our annual deficit in the mineral balance of trade could approach as much as $100 billion by the Year 2000.

The Mining and Minerals Policy Act of 1970 affirmed that it was "in the national interest to foster and encourage private enterprise in the development of economically sound and stable domestic mining, minerals, metal and mineral reclamation industries."

Improvement of domestic productivity in the mining, minerals, metal, mineral reclamation, and energy industries requires accelerated development of new and improved technology and rapid introduction thereof into all stages including:

Exploration
Mining and petroleum and natural gas production
Processing
Use
Recovery and Recycling

In all of the above appropriate provision must be made for the health and safety of workers and for environmental enhancement through: minimizing air, water, and land pollution, land restoration, and esthetic improvement.

To bring all of our national technological resources to bear upon the solution of current major problems, the Government must sponsor industry-government-academia consortia to tackle major problems, sponsor measures that will encourage rapid introduction of new and improved technology into industry, and improved mission-oriented research supported by the Bureau of Mines, the Geological Survey, and the Office of Coal Research.

Major problems to tackle include:

* * Discovery and assessment of resources presently untouched by our existing mines and wells.
* * Development of safe and efficient coal mining systems to significantly increase underground extraction ratios from the present level of about one-half.

* * Development of improved petroleum recovery methods to significantly increase extraction ratios above the present level of about one-third.
* * Development of underground and surface mining methods to minimize degradation of the land surface, subsidence, and harm to surface and subsurface waters.
* * Development of clean solid, liquid, and gaseous fuels from coal, petroleum, and other energy materials.
* * Improvement of combustion processes to increase efficiency and to reduce emissions of fumes and particulates.
* * Improvement of electricity generation, transmission, and conversion methods.
* * Development of new energy sources including geothermal and solar.
* * Development of stronger, lighter, corrosion-resistant and temperature-resistant materials.
* * Improvement of recycling techniques to conserve natural materials and energy, and to promote environmental enhancement.
* * Stimulation of measures to conserve energy and materials in actual or potential short supply.

RECOMMENDATIONS

1. To improve the development of domestic resources and to provide more responsive administrative mechanisms, action should be taken by the Congress on Administration recommendations to:

a. form a Department of Energy and Natural Resources (H.R. 9090)

b. provide organic act for Bureau of Land Management (S. 1041 and H.R. 5441)

c. modify right-of-way limitations (Part of S. 1041 and H.R. 5441)

d. provide for revision of the mineral leasing laws (S. 1040 and H.R. 5442)

e. provide for regulation of surface mining activities (S. 923 and H.R. 4863)

f. amend the Natural Gas Act (S. 2048 and H.R. 7507)

g. facilitate development of deepwater ports (S. 1751 and H.R. 7501)

2. To insure that the varied scientific and technologic resources of the nation are brought to bear upon solving current major minerals and energy problems, ways should be developed to stimulate maximum cooperation among industry, government, and academia.

3. To encourage domestic exploration and to stimulate increased productivity through prompt introduction of new and improved technology, the tax structure should be reviewed to insure a favorable economic climate. (For example: The Treasury Department's "Proposal for Tax Change" dated April 30, 1973, covered exploratory drilling for new domestic sources of oil and gas.)

4. To improve our knowledge of domestic energy and mineral resources, the Department of the Interior should expand its cooperation with industry in investigations of these resources.

5. To improve the national information base for assessment of energy and minerals problems, the Department of the Interior should expand its information collection, analysis, and dissemination functions, including foreign data as appropriate.

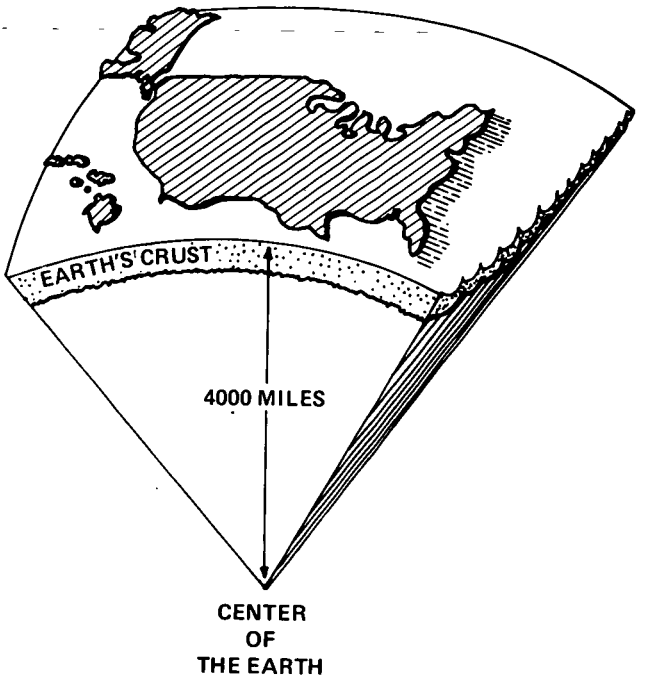
6. To provide protection of domestic industries threatened by unfair trade practices, the Trade Reform Act of 1973 (H.R. 6767) proposed by the Administration should be enacted by the Congress.

7. To provide reliable transportation at reasonable costs for the mining, minerals, metal, mineral reclamation, and energy industries, industry and government must intensify development of coordinated plans for efficient handling of large volumes of low-value materials such as mineral fuels and ores. Deep-water ocean ports for deepdraft ore-oil-grain bulk carriers, and improved domestic rail, barge, and pipeline systems are needed.

8. To provide accurate information on the possible harmful effects of elements and compounds, scientific agencies should give high priority to the determination of the minimum quantities essential for life and the maximum levels that can be safely tolerated by plants, animals, and man, as well as normal backgrounds and details of emission and absorption mechanisms.

9. To aid in conserving energy and materials in actual or potential short supply, the Government should promote continuing education in resources conservation.

THE STATE OF THE DOMESTIC MINING, MINERALS, AND MINERAL RECLAMATION INDUSTRIES



THE LAND AREA OF THE U.S. IS ABOUT
3½ MILLION SQUARE MILES,
6% OF THE EARTH'S LAND AREA.

"NATURAL RESOURCES" -

PRIMARY SOURCES OF ALL WEALTH.

ROCKS, SOILS, WATER, AND AIR CONTAIN
"MINERAL RESOURCES"

MINERALS ARE THE MAJOR SOURCE OF THE "ELEMENTS"

ACTINIUM	EINSTEINIUM	MENDELEVIUM	SAMARIUM
ALUMINUM	ERBIUM	MERCURY	SCANDIUM
AMERICIUM	EUROPIUM	MOLYBDENUM	SELENIUM
ANTIMONY	FERMIUM	NEODYMIUM	SILICON
ARGON	FLUORINE	NEON	SILVER
ARSENIC	FRANCIUM	NEPTUNIUM	SODIUM
ASTATINE	GADOLINIUM	NICKEL	STRONTIUM
BARIUM	GALLIUM	NITROGEN	SULFUR
BERKELIUM	GERMANIUM	NOBELIUM	TANTALUM
BERYLLIUM	GOLD	OSMIUM	TECHNETIUM
BISMUTH	HAFNIUM	OXYGEN	TELLURIUM
BORON	HELIUM	PALLADIUM	TERBIUM
BROMINE	HOLMIUM	PHOSPHORUS	THALLIUM
CADMIUM	HYDROGEN	PLATINUM	THORIUM
CESIUM	INDIUM	PLUTONIUM	THULIUM
CALCIUM	IODINE	POLONIUM	TIN
CALIFORNIUM	IRIDIUM	POTASSIUM	TITANIUM
CARBON	IRON	PRASEODYMIUM	TUNGSTEN
CERIUM	KRYPTON	PROMETHIUM	URANIUM
CHLORINE	LANTHANUM	PROTACTINIUM	VANADIUM
CHROMIUM	LAWRENCIUM	RADIUM	XENON
COBALT	LEAD	RADON	YTTERBIUM
COLUMBIUM	LITHIUM	RHENIUM	YTTRIUM
COPPER	LUTETIUM	RHODIUM	ZINC
CURIUM	MAGNESIUM	RUBIDIUM	ZIRCONIUM
DYSPROSIUM	MANGANESE	RUTHENIUM	

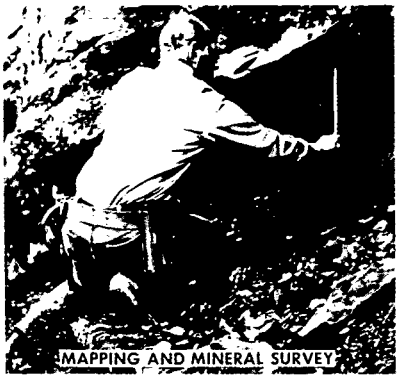
THESE "ELEMENTS" ARE THE FUNDAMENTAL BUILDING BLOCKS OF ALL LIFE AND ALL MATERIAL THINGS'. THEY OCCUR IN NATURE ALMOST ALWAYS IN CHEMICAL COMBINATIONS OF TWO OR MORE ELEMENTS.

IN THE EARTH'S CRUST – THE TOP FEW MILES – OXIDES OF SILICON, ALUMINUM, IRON, AND CALCIUM ARE MOST COMMON, BUT MOST ELEMENTS ARE SO RARE THAT THEIR AVERAGE CONCENTRATION IN THE CRUST CAN BE MEASURED ONLY IN SMALL FRACTIONS OF A PERCENT OR IN PARTS PER MILLION! FOR EXAMPLE:

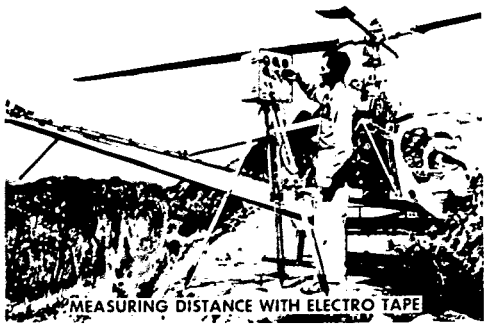
COPPER = 50 PARTS PER MILLION
GOLD = 0.004 PARTS PER MILLION

CONCENTRATED DEPOSITS OF MINERALS MUST BE FOUND BY EXPLORATION.

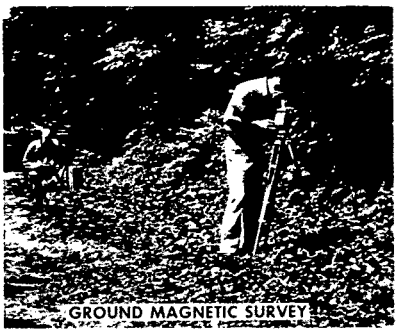
EXPLORATION TECHNIQUES



MAPPING AND MINERAL SURVEY

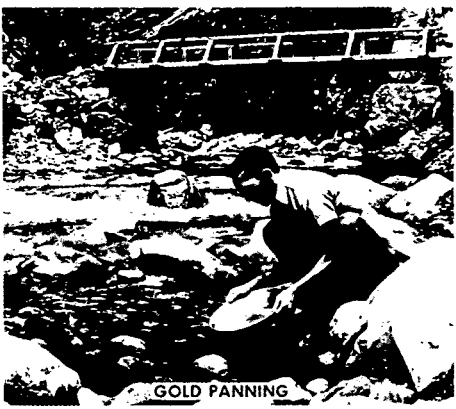


MEASURING DISTANCE WITH ELECTRO TAPE



GROUND MAGNETIC SURVEY

AIRBORNE MAGNETIC SURVEY



GOLD PANNING

OCEAN FLOOR SAMPLING

EXPLORATION
INCLUDES:

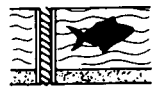
REMOTE SENSING BY SATELLITE AND PHOTOGRAPHY

GRAVITY, MAGNETIC, AND PHOTOGRAPHIC SURVEY

SEISMIC, ELECTRIC, AND RADIOACTIVE PROSPECTING

GEOLOGIC INTERPRETATION

GEOCHEMICAL AND GEOBOTANICAL ANALYSIS



DRILLING AND SAMPLING

The direction and emphasis of exploration for a given mineral commodity is both a measure of the resource potential of specific areas or geologic features and a reflection of trends in the utilization of that mineral commodity.

Despite increasing demand for minerals and major new domestic exploration in 1972 for copper, fluorine, gold, silver, molybdenum, nickel, oil and gas, and zinc, overall domestic exploration was reduced in 1972.

Causes of decline in mineral exploration include:

Short-term uncertainties in demand for some metals;

Uncertainties over future restrictions on land use;

Prospecting moratorium in some areas;

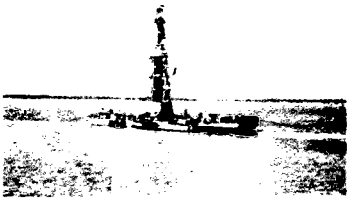
New pollution-control measures at domestic mines and smelters that have closed some and increased costs at others; and

Ad valorem tax laws in some states that discourage or limit exploration.

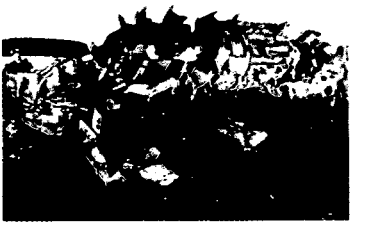
Additional details of 1972 exploration are provided in Appendix II.

After valuable mineral deposits are found, they must be developed for mining.

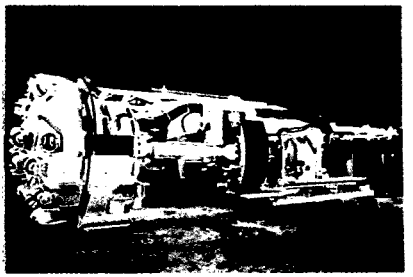
MINING



OFFSHORE WELLS

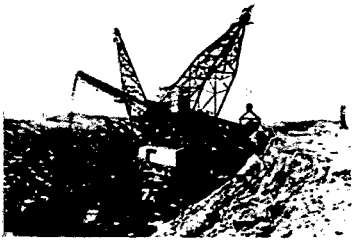


CONTINUOUS MECHANICAL MINER

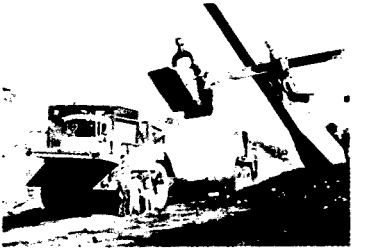


GIANT BORING MACHINE

ROOF-BOLTED HAULAGEWAY



WHEEL EXCAVATOR

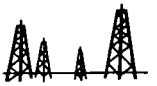


DIESEL-ELECTRIC 240-TON HAULING UNIT

MINING
INCLUDES:

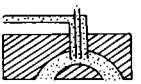
SURFACE MINING

UNDERGROUND MINING


PETROLEUM AND NATURAL GAS WELLS

DREDGING

QUARRYING


WELLS

AIR REDUCTION

DEEPEST MINES ABOUT 2 MILES, DEEPEST WELLS ABOUT 6 MILES.

IN 1972 600,000 PERSONS WERE EMPLOYED IN THE U.S.A.

MINERAL RAW MATERIALS MINED WERE VALUED AT $32 BILLION

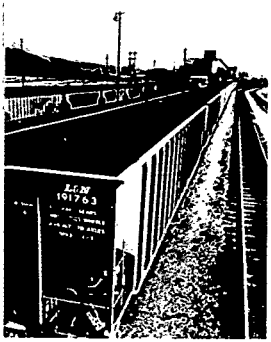
As near-surface and high-grade deposits are mined out, it is necessary to move to deeper and lower-grade deposits. Mining operations now extend to the continental shelves and are expected to extend to the seabeds.

Today half of the coal, two-thirds of the oil, and important fractions of other minerals remain behind after mining has ceased. Inherently safe mining systems must be developed that will also improve present extraction ratios. Mining systems must also operate with minimum damage to the environment.

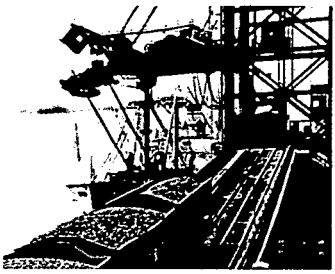
The wide-scale use of huge mechanized equipment in mining has changed mining from a labor-intensive to a capital-intensive industry, but a skilled and stable labor force is highly important to productivity.

After mining, the transportation net becomes important.

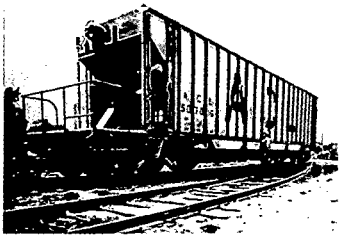
MOVING BULK MINERALS



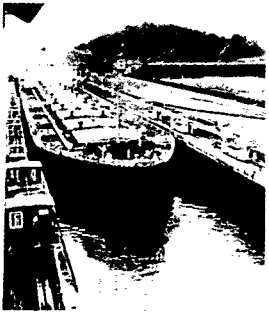
10,000-TON UNIT TRAIN



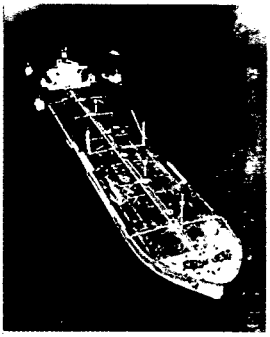
8,000-TON-PER-HOUR LOADER



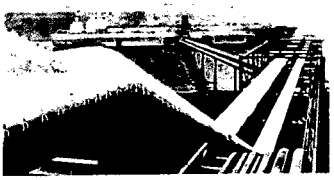
135-TON HOPPER CAR



LARGE BULK-CARRIER IN PANAMA CANAL



SUPER-TANKER

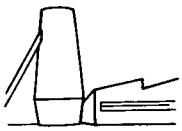


LIQUIFIED NATURAL GAS PIPELINE AND VESSEL

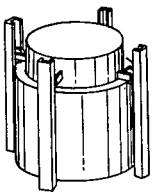
37-143 O - 74 - 24

PROCESSED MINERALS AND ENERGY

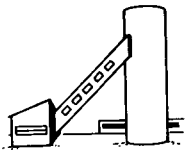
INCLUDE



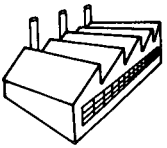
STEEL PRODUCTION



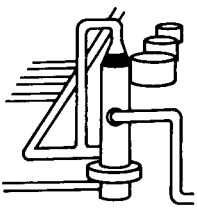
GAS



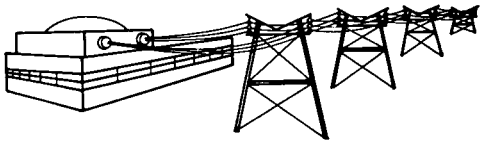
BRICK, TILE, GLASS, CEMENT



ALUMINUM, COPPER, OTHER METALS



PETROLEUM REFINING
PETRO CHEMICALS,
PLASTICS, FERTILIZERS



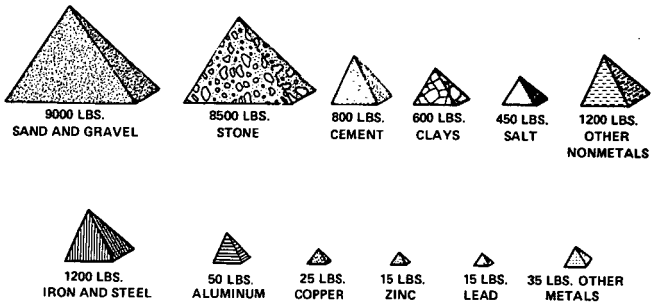
POWER GENERATION AND TRANSMISSION

IN 1972 3,700,000 PERSONS WERE EMPLOYED IN THE U.S.A.

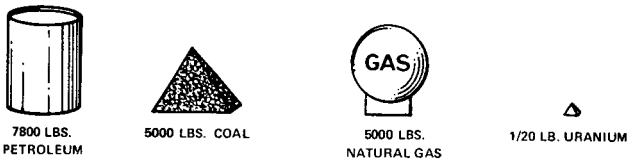
PROCESSED MATERIALS OF MINERAL ORIGIN AND ENERGY WERE VALUED AT MORE THAN

$150 BILLION

ABOUT 40,000 POUNDS OF NEW MINERAL MATERIALS ARE REQUIRED ANNUALLY FOR EACH U.S. CITIZEN

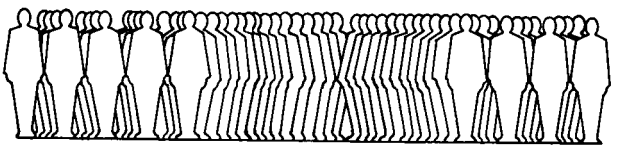


PLUS



TO GENERATE:

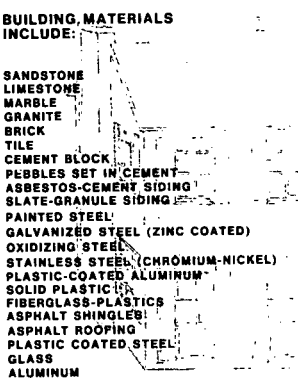
ENERGY EQUIVALENT TO 300 PERSONS WORKING AROUND-THE-CLOCK FOR EACH U.S. CITIZEN



U. S. TOTAL USE OF NEW MINERAL SUPPLIES IN 1972 EXCEEDED 4 BILLION TONS !

MOST PROCESSED MATERIALS OF MINERAL ORIGIN ARE USED IN LONG - ENDURING APPLICATIONS

EXAMPLE. IN OUR HOMES



BUILDING MATERIALS INCLUDE:

SANDSTONE
LIMESTONE
MARBLE
GRANITE
BRICK
TILE
CEMENT BLOCK
PEBBLES SET IN CEMENT
ASBESTOS-CEMENT SIDING
SLATE-GRANULE SIDING
PAINTED STEEL
GALVANIZED STEEL (ZINC COATED)
OXIDIZING STEEL
STAINLESS STEEL (CHROMIUM-NICKEL)
PLASTIC-COATED ALUMINUM
SOLID PLASTIC
FIBERGLASS-PLASTICS
ASPHALT SHINGLES
ASPHALT ROOFING
PLASTIC COATED STEEL
GLASS
ALUMINUM
ETC.

PLUMBING MATERIALS INCLUDE:

PLASTIC PIPE
SOFT COPPER TUBING
COPPER PIPE
BRASS PIPE
BLACK IRON PIPE
GALVANIZED IRON PIPE (ZINC)
CAST IRON PIPE
LEAD PIPE (WASTE LINES ONLY)
LEAD SHEET (SHOWERS, ETC.)
GLASS PIPE
ZINC DIE-CASTINGS
CHROMIUM-PLATED IRON
STAINLESS STEEL
VITREOUS CHINA
PORCELAIN WARE
PORCELAIN-COATED STEEL
CEMENT-ASBESTOS PIPE
CLAY TILE PIPE
PLASTIC SHEET
CERAMIC TILE
PLASTIC PARTS AND FITTINGS
CHROMIUM-PLATED BRASS
NICKEL-PLATED BRASS
ETC.

INSULATING MATERIALS INCLUDE:

ROCK WOOL
FIBERGLASS
PLASTER (GYPSUM)
PLASTER BOARD (GYPSUM BOARD)
VERMICULITE
PERLITE
FLY-ASH BLOCK
ALUMINUM FOIL
ALUMINUM SHADE SCREENING
BRONZE SHADE SCREENING
TAR PAPER
PLASTIC SHEET
FOAMED PLASTIC
FOAMED GLASS
DOUBLE-PANE GLASS
ETC.

AND

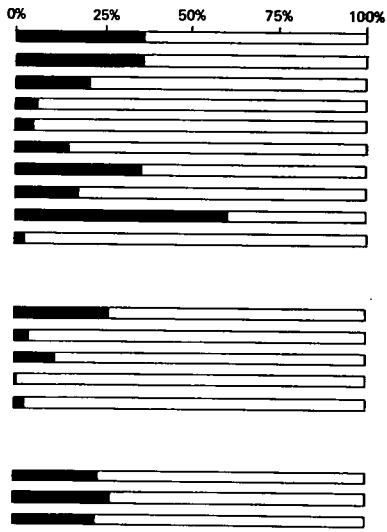
IN OUR HOMES HEAT, LIGHT AND AIR CONDITIONING ARE PROVIDED BY ENERGY DERIVED FROM COAL, OIL, GAS, URANIUM, WATER POWER, OR GEOTHERMAL ENERGY.

Fig. 1

OLD SCRAP RECYCLED IN THE U.S. IS SIGNIFICANT BUT IMPROVEMENT IS POSSIBLE

	SHORT TONS
MAJOR	
IRON	46,400,000*
LEAD	506,000
COPPER	473,000
ALUMINUM	250,000
ZINC	81,000
CHROMIUM	60,000
NICKEL	73,900
TIN	13,000
ANTIMONY	17,600
MAGNESIUM	2,700
MINOR	
MERCURY	494
TUNGSTEN	250
TANTALUM	62
COBALT	65
SELENIUM	15
PRECIOUS	
SILVER	1,049
GOLD	82
PLATINUM GROUP	10

PERCENT OF U.S. CONSUMPTION DERIVED FROM SCRAP



*Includes Exports

MINERAL RECLAMATION

Significant quantities of metal and mineral scrap are recycled in the United States.

"New Scrap" is generated in industrial manufacturing operations.

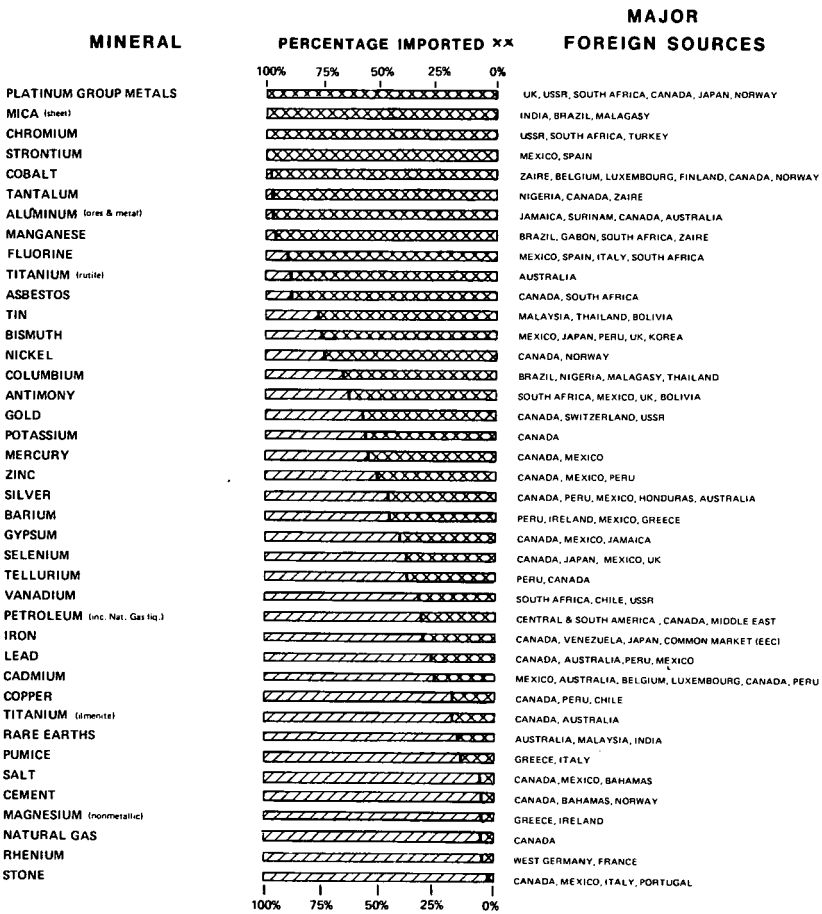
Much industrial New Scrap is collected regularly and recycled, but, because such scrap may circulate several times in any given year, statistics thereon are difficult to collect, and none are included herein.

"Old Scrap" is material largely recovered from junk. Old metal scrap recycled is valued at about $2 billion annually. Fig. 1 shows the relative contribution of major types of Old Scrap to total supplies in 1972.

The Department of the Interior has a variety of research programs intended to improve the technology of recycling to conserve energy and virgin materials, to make profitable use of hitherto waste mineral materials, and to minimize environmental degradation incident to common waste disposal practices. Industry is currently using some of the processes developed. Appendix IV provides details.

Fig. 2

IMPORTS SUPPLIED SIGNIFICANT PERCENTAGES OF TOTAL U.S. DEMAND IN 1972



MINERAL IMPORTS

Some minerals have not been found in the United States in economically workable concentrations. Some others are found in more readily workable deposits in other nations. Consequently, as shown by Fig. 2, imports supplied significant percentages of total United States demand for several mineral commodities in 1972.

Many of the minerals covered by Fig. 2 are among those that have been stockpiled by the Government. (Item 14 in each Mineral Profile in Appendix I gives details). Quantities of many stockpiled materials are now considered excess to stockpile objectives. Some of these excesses are being sold currently, thus reducing the need for imports of these materials at this time.

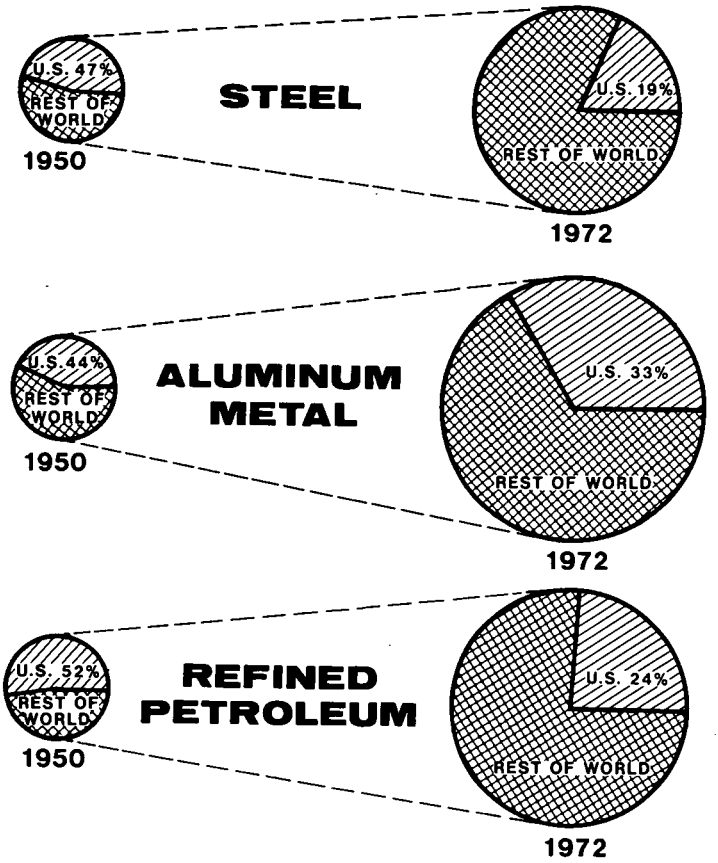
In disposing of excesses, the Government complies with the law in avoiding disruption of markets. But the existence of excesses not yet scheduled for disposal causes uncertainty in planning by industry for possible domestic mineral development.

In recent years U.S. imports of several major commodities, including petroleum, iron and steel, and bauxite and alumina, have been increasing. U.S. mineral imports come from a number of diverse nations, as illustrated by Fig. 2.

Meanwhile, many other industrialized nations are increasing their mineral imports also.

Fig. 3

U.S. PRODUCTION IS FALLING BEHIND IN RELATION TO THE REST OF THE WORLD



NOTE: THE LARGER 1972 CIRCLES SHOW THE GROWTH OF WORLD PRODUCTION.

GLOBAL PERSPECTIVE

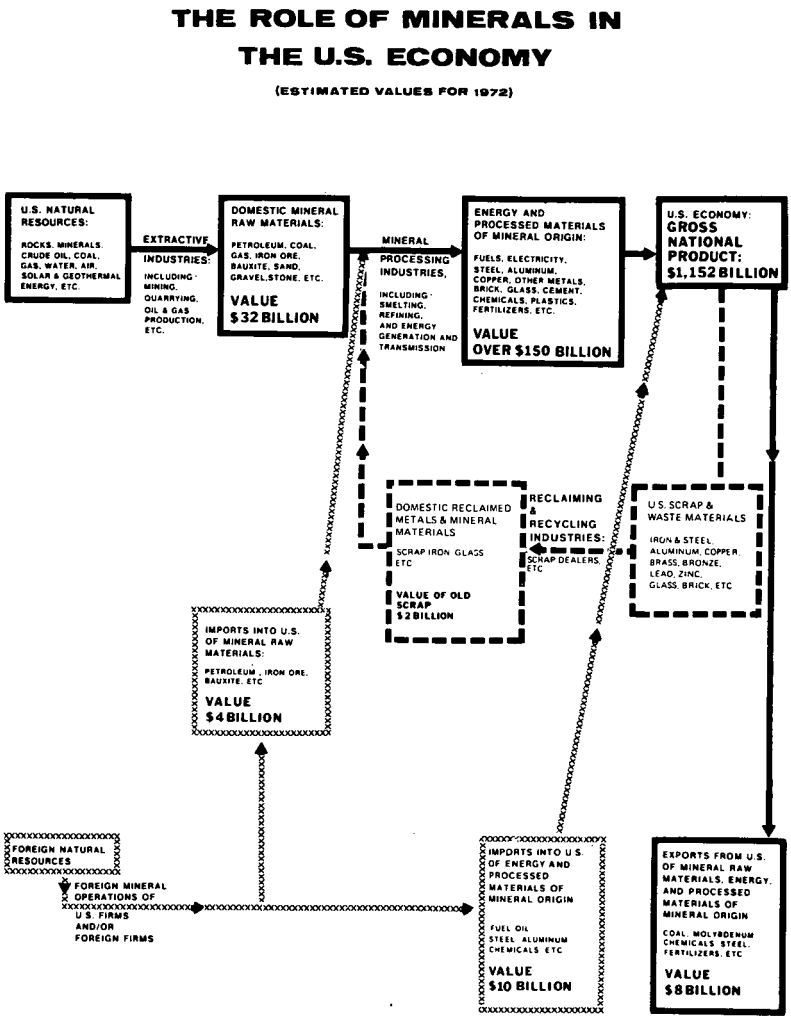
U.S. production and usage of minerals must be considered in the light of the total world situation.

Over the past two decades world production of major processed materials of mineral origin has increased sharply, as shown by Fig. 3. While U.S. production has increased in quantitative terms, its relative role as a world consumer of mineral raw materials and as a world manufacturer of products of mineral origin has shrunk. The United States now produces only about one-fifth of the world's steel, one-fourth of its refined petroleum, and one-third of its aluminum metal. Many other minerals are used in proportion to steel, petroleum, and aluminum, and the same situation holds for them. Item 6 in each mineral profile in Appendix I gives details.

Consequently, the United States is encountering steadily increasing competition in the acquisition of non-domestic mineral raw materials as other industrialized countries also seek reliable sources of reasonably-priced mineral raw materials.

In addition, the United States is losing its competitive position in traditional products with large world markets and other industrialized nations are increasingly engaged in selling therein. Thus, our ability to pay for foreign mineral raw materials is diminished and our balance of trade and balance of payments problems are made worse.

Fig. 4


THE ROLE OF MINERALS IN THE U.S. ECONOMY
(ESTIMATED VALUES FOR 1972)
U.S. NATURAL RESOURCES:
ROCKS, MINERALS, CRUDE OIL, COAL, GAS, WATER, AIR, SOLAR & GEOTHERMAL ENERGY, ETC.
EXTRACTIVE INDUSTRIES:
INCLUDING MINING, QUARRYING, OIL & GAS PRODUCTION, ETC.
DOMESTIC MINERAL RAW MATERIALS:
PETROLEUM, COAL, GAS, IRON ORE, BAUXITE, SAND, GRAVEL, STONE, ETC.
VALUE $32 BILLION
MINERAL PROCESSING INDUSTRIES,
INCLUDING SMELTING, REFINING, AND ENERGY GENERATION AND TRANSMISSION
ENERGY AND PROCESSED MATERIALS OF MINERAL ORIGIN:
FUELS, ELECTRICITY, STEEL, ALUMINUM, COPPER, OTHER METALS, BRICK, GLASS, CEMENT, CHEMICALS, PLASTICS, FERTILIZERS, ETC.
VALUE OVER $150 BILLION
U.S. ECONOMY: GROSS NATIONAL PRODUCT: $1,152 BILLION
DOMESTIC RECLAIMED METALS & MINERAL MATERIALS
SCRAP IRON, GLASS ETC
VALUE OF OLD SCRAP $2 BILLION
RECLAIMING & RECYCLING INDUSTRIES:
SCRAP DEALERS, ETC
U.S. SCRAP & WASTE MATERIALS
IRON & STEEL, ALUMINUM, COPPER, BRASS, BRONZE, LEAD, ZINC, GLASS, BRICK, ETC
IMPORTS INTO U.S. OF MINERAL RAW MATERIALS:
PETROLEUM, IRON ORE, BAUXITE, ETC
VALUE $4 BILLION
FOREIGN NATURAL RESOURCES
FOREIGN MINERAL OPERATIONS OF U.S. FIRMS AND/OR FOREIGN FIRMS
IMPORTS INTO U.S. OF ENERGY AND PROCESSED MATERIALS OF MINERAL ORIGIN
FUEL OIL, STEEL, ALUMINUM, CHEMICALS, ETC
VALUE $10 BILLION
EXPORTS FROM U.S. OF MINERAL RAW MATERIALS, ENERGY, AND PROCESSED MATERIALS OF MINERAL ORIGIN
COAL, MOLYBDENUM, CHEMICALS, STEEL, FERTILIZERS, ETC
VALUE $8 BILLION

THE ROLE OF MINERALS

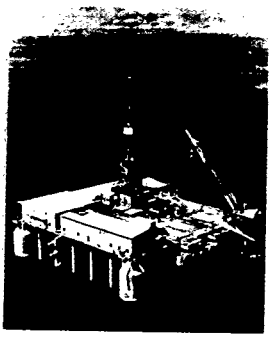
MINERALS AND ENERGY ARE THE LIFEBLOOD OF OUR ECONOMY

FIRST, THE U.S. EXTRACTIVE INDUSTRIES
CONVERT
"MINERAL RESOURCES"
INTO
"MINERAL RAW MATERIALS"
VALUED AT $32 BILLION

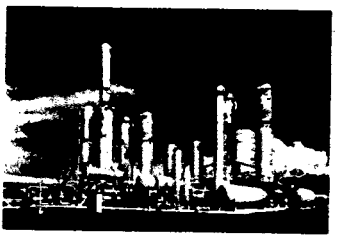
THEN, THE U.S. MINERAL PROCESSING INDUSTRIES
CONVERT
"MINERAL RAW MATERIALS"
INTO
"ENERGY AND PROCESSED MATERIALS OF MINERAL ORIGIN"
VALUED AT OVER $150 BILLION

The following pages review the 1972 position of the major segments of the mining, minerals, metal, mineral reclamation, and energy industries that account for the greatest part of the 4 billion tons and $150 billion value of production. All data are preliminary, and estimates have been made where necessary. The graphs show clearly the trends of the past two decades and our present position.

ENERGY



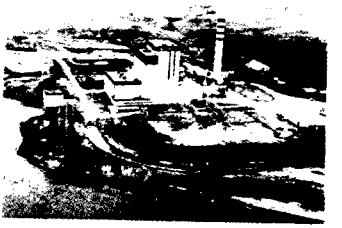
OFF-SHORE DRILLING



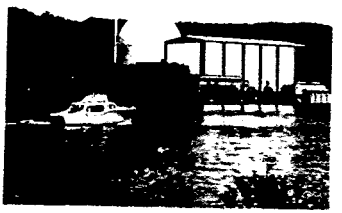
NATURAL GAS PROCESSING

GEOTHERMAL POWER PLANT

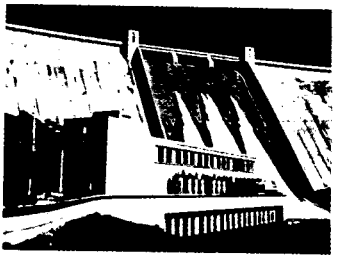
OIL REFINERY



MINE-MOUTH POWER PLANT



NUCLEAR POWER



HYDROELECTRIC POWER

ENERGY

An adequate and secure supply of energy is essential to the well-being and progress of an industrialized nation. For most of its history, the United States has had a plentiful supply of energy from diverse sources and at reasonable prices. For more than 250 years, energy was provided predominantly by wood, for the next 50 years by coal, and since the late 1940's by petroleum and natural gas. Lesser sources of energy, but important for electricity generation, include hydropower and more recently nuclear power. Geothermal energy is just entering the picture, and solar energy may have possibilities.

To support our economic growth and rising standard of living, the demand for energy has doubled in the past two decades, reaching an all-time high of approximately 72 quadrillion Btu 1/in 1972. While coal and hydropower have made a relatively constant contribution to total energy supplies during this period, as indicated in Fig. 5, the quantitative contribution of natural gas has tripled and petroleum use has about doubled. The contribution of nuclear power, though growing rapidly, has been a small part of total supplies. The gap between U.S. energy demand and domestic supplies has widened at an accelerated rate in recent years. Net imports of fuels now supply about 13 percent of total energy demand.

Along with other factors, the rapid growth in world energy demand coupled with environmental restrictions on the use of high-sulfur fuels, particularly in the United States, have caused an increasing strain on available low-sulfur fuel supplies. In 1972, fuel shortages in the United States became more widespread despite increases in petroleum imports which rose to 29 percent of total U.S. petroleum supply.

A major factor in the lack of availability of sufficient energy supplies is that discovery and/or production of domestic fuels have not kept pace with rising demand. This situation has evolved for a variety of reasons, including:

1. Environmental improvement programs of Federal, State, and local governments which impacted on several of the following items;

2. Delays in construction of the Alaskan pipeline and in the leasing of Federal offshore areas;

1/ A Btu (British thermal unit) is a standard heat-measuring unit and is defined generally as the quantity of heat required to raise the temperature of 1 pound of water 1 degree Fahrenheit at conditions of maximum density.

Fig. 5

U.S. DEMAND FOR MAJOR ENERGY SOURCES

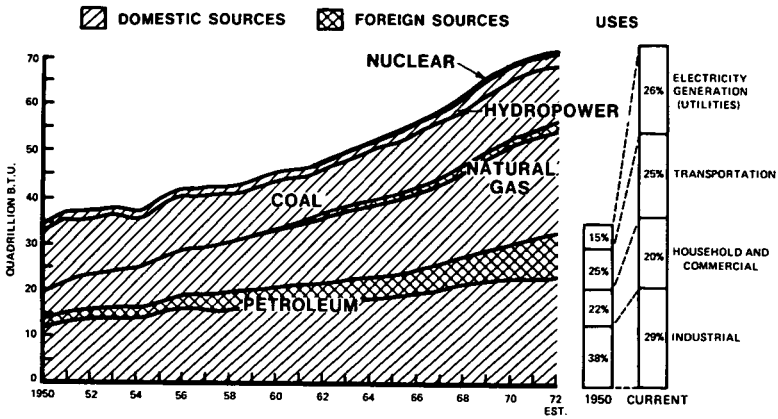
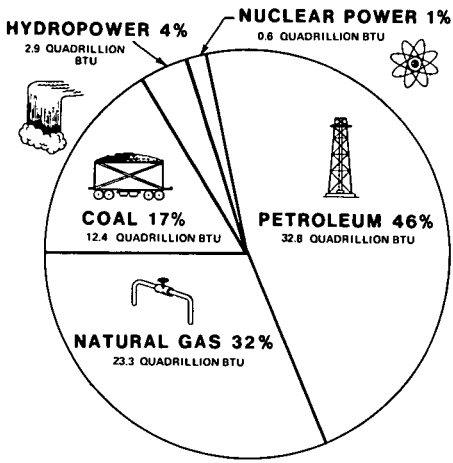


Fig. 6

CONSUMPTION OF ENERGY BY SOURCES (1972)



37-143 O - 74 - 25

3. Higher than expected costs and delays in the development of nuclear power;

4. Despite import controls and other incentives, uncertainties related to future oil imports and environmental controls served as disincentives to develop domestic oil resources and refining capacity;

5. Regulation of natural gas prices;

6. High cost of low-sulfur coal compared to low-sulfur oil and gas to electric utilities and industrial users in the East;

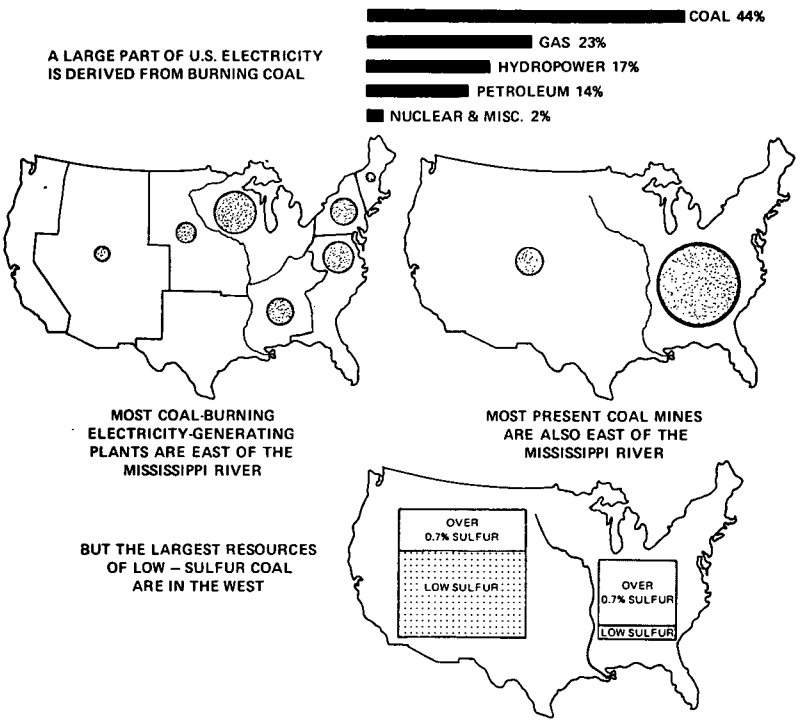
7. Pollution control devices tend to increase fuel consumption.

Obtaining low-sulfur fuel supplies has been a major problem for electric utilities and industries, particularly in the East. Available coals generally are too high in sulfur content to meet environmental regulations in most eastern areas. Since the principal resources of low-sulfur coals are in the West, as indicated in Fig. 7, most plants along the East Coast have switched to oil, which also is in short supply, with the result that they have become more than 90 percent dependent on foreign sources for their fuel. The effects of sulfur regulations will become more severe in terms of fuel cost and dependency on foreign supplies as additional plants come under the State Implementation Plans (S.I.P.'s) of the Environmental Protection Agency which will become fully effective by 1975. One-fourth of the total primary energy consumed annually in the United States is used for electricity generation and another 29 percent is used for industrial purposes. Electricity generation alone used 66 percent of the coal consumed in 1972, 18 percent of the natural gas, 9 percent of the petroleum, and 96 percent of the uranium. The contribution of these energy sources and hydropower to the production of electricity is shown in Fig. 6.

Problems in expanding energy supplies appreciably from domestic sources are expected to continue for several years because of the cumulative effect of the various adverse factors. Therefore, in the near-term the United States will of necessity have to increase its dependence on foreign energy supplies by importing increasing quantities of oil and natural gas to fill the growing gap between demand and domestic supply.

Fig. 7

SULFUR EMISSION REGULATIONS ARE FORCING MAJOR CHANGES IN COSTS AND SOURCES OF FUELS FOR ELECTRIC POWER GENERATION



For the long-term, opportunities are available for alleviating the energy problems and assuring adequate supplies of energy through optimizing the use of domestic resources. The basic energy position of the United States is reasonably sound. Domestic coal resources in the ground are adequate to supply requirements for several hundred years, and oil and gas resources are sufficient to last well beyond the year 2000. In addition, the United States has enormous oil shale deposits, some tar sand deposits, and sources of heat within the earth's crust. Low-cost uranium resources are the scarcest, and their adequacy for the long-term will depend on several factors, including the advent of the breeder reactor. Most desirable sites for hydroelectric dams have been utilized.

To provide for the Nation's current and future energy needs in balance with economic, environmental, and national security goals will require a more comprehensive, integrated national energy policy. In his second Energy Message to the Congress, dated April 18, 1973, the President presented a comprehensive program with the following objectives:

"-- increase domestic production of all forms of energy;

-- act to conserve energy more effectively;

-- strive to meet our energy needs at the lowest cost consistent with the protection of both our national security and our natural environment;

-- reduce excessive regulatory and administrative impediments which have delayed or prevented construction of energy-producing facilities;

-- act in concert with other nations to conduct research in the energy field and to find ways to prevent serious shortages; and

-- apply our vast scientific and technological capacities -- both public and private -- so we can utilize our current energy resources more wisely and develop new sources and new forms of energy."

In addition, the President announced actions and proposals, contingent upon their consistency with acceptable environmental risks, to achieve the above objectives. These paraphrased, included:

1. Increasing the availability of energy resources on the Outer Continental Shelf (OCS) through an accelerated oil and gas leasing program, and developing a long-term leasing program for all energy resources on public lands.

2. Suspending the oil import quota program, removing tariffs, and instituting a license-fee system to increase the availability of foreign oil while encouraging the exploration and development of our domestic oil and the construction of domestic refineries.

3. Encouraging increased exploratory drilling for new oil and gas fields through extension thereto of the investment credit provisions of the present tax law.

4. Examining incentives aimed at increasing our domestic oil storage capacity or shut-in production to assure supplies in case of a temporary cut-off from foreign sources.

5. Deregulating the price of natural gas from new wells, of gas newly dedicated to interstate markets, and of continuing gas production from expired contracts, but with the option of imposing a ceiling on the price of the gas when circumstances warrant.

6. Removing the present right-of-way restrictions on building the trans-Alaskan pipeline.

7. Expanding the use of our vast coal resources through research and development, with special emphasis on technology for sulfur removal and the development of low-cost, clean-burning forms of coal; through incentives (allowed by State utility commissions) for using new environmental technology; by extending the time beyond 1975 for meeting secondary clean air standards; and by substituting coal for low-sulfur fuel in periods of fuel shortages, under certain circumstances.

37-143 O - 74 - 26

8. Facilitating the siting and licensing of nuclear power plants, and the licensing of deepwater ports to provide for efficient transportation of imported oil.

9. Expanding uranium enrichment capacity by private industry.

10. Continuing high-priority development of the liquid metal fast breeder reactor.

11. Proceeding with the pilot oil shale leasing program and the leasing of geothermal fields on Federal lands.

12. Conserving energy through voluntary efforts, educational programs, and improvements in utilization efficiencies including transportation systems and building construction and insulation.

13. Continuing or increasing emphasis on research and development in environmental control technologies, fossil fuel extraction and utilization technologies, geothermal energy, nuclear reactor safety, radioactive waste storage, controlled thermonuclear fusion, laser fusion, solar energy, and magnetohydrodynamics (MHD).

14. Developing a program of international cooperation on energy matters including research and development and energy supplies.

15. Improving the ability of the Executive Branch to develop, implement, and coordinate energy programs through organizational changes and legislation to establish a Department of Energy and Natural Resources (DENR).

* * * *

Further details on major energy commodities -- petroleum natural gas, coal, uranium -- follow on the next several pages.

Fig. 8

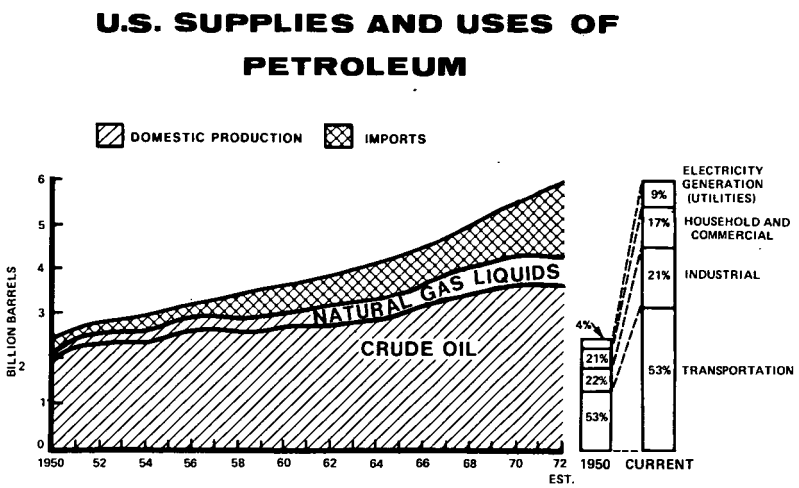
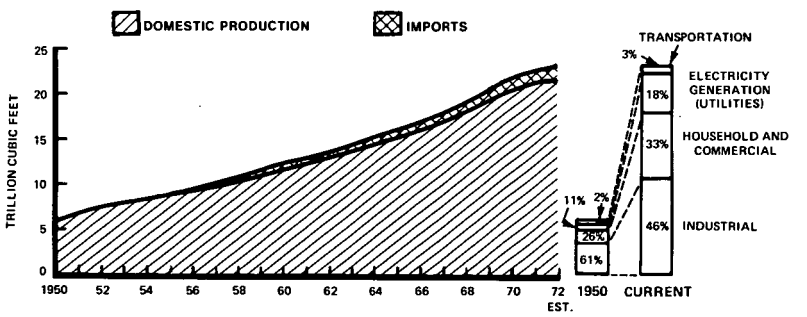

U.S. SUPPLIES AND USES OF PETROLEUM
DOMESTIC PRODUCTION
IMPORTS
BILLION BARRELS
NATURAL GAS LIQUIDS
CRUDE OIL
1950 52 54 56 58 60 62 64 66 68 70 72 EST.
1950
CURRENT
4%
21%
22%
53%
9%
17%
21%
53%
ELECTRICITY GENERATION (UTILITIES)
HOUSEHOLD AND COMMERCIAL
INDUSTRIAL
TRANSPORTATION

Fig. 9


U.S. SUPPLIES AND USES OF NATURAL GAS
DOMESTIC PRODUCTION
IMPORTS
TRILLION CUBIC FEET
1950 52 54 56 58 60 62 64 66 68 70 72 EST.
1950
CURRENT
11%
2%
26%
61%
3%
18%
33%
46%
TRANSPORTATION
ELECTRICITY GENERATION (UTILITIES)
HOUSEHOLD AND COMMERCIAL
INDUSTRIAL

PETROLEUM

$26 BILLION (EST.)
263,000 EMPLOYEES IN OIL & GAS PROD.
- PLUS -
151,000 EMPLOYEES IN PETROLEUM REF.

--U.S. crude oil and natural gas liquids (NGL) production of 4.1 billion barrels in 1972 was valued at $13.2 billion. Prices were about the same as in 1971. Domestically refined products of 4.8 billion barrels from U.S. and foreign oils were valued at $25 billion (est. value of shipments).
--The balance of petroleum trade deficit was nearly $4 billion in 1972.
--Domestic production of crude oil and NGL has not kept pace with the rapidly rising demand and productive capacity has essentially peaked, reflecting the long downtrend in exploration and declining reserves.
--Insufficient availability of natural gas and low-sulfur coal accelerated demand for heating oils and liquefied petroleum gases, precipitating shortages in many parts of the country. Gasoline demand also was strong.
--Import quotas were raised substantially in 1972. Imports grew from 26 percent of supply in 1971 to 29 percent in 1972 and are expected to continue increasing.
--Environmental constraints delayed the Department of the Interior's five-year OCS leasing program and issuance of a right-of-way permit for the trans-Alaska pipeline. The building of refineries, LNG plants, terminals, and deepwater ports has been restricted in many areas.
--About 850,000 acres in potential oil and gas areas in the OCS were eventually leased in 1972 for bonus bids totaling more than $2.2 billion.
--Additional details on petroleum are in the Appendix.

NATURAL GAS

$14 BILLION (EST.)
FOR EMPLOYEES, SEE ABOVE

--Demand was only partly satisfied in 1972 as proved gas reserves continued to decline. Gas supplies to some customers were curtailed or cut off, and some prospective accounts were denied service.
--Domestic production of 22.9 trillion cubic feet valued at $4.5 billion accounted for 95 percent of supply. Imports were valued at over $400 million. Total value of gas delivered to consumers was an estimated $14 billion.
--Dependence on foreign supplies is expected to increase.
--Several companies are planning to manufacture synthetic natural gas (SNG) from petroleum feedstocks and to import LNG. These supplies are expected to cost $1.00-$1.25 per thousand cubic feet (Mcf), compared to East Coast wholesale (city gate) prices of $50¢-75¢ per Mcf and wellhead prices of 26¢ per Mcf for Louisiana offshore gas.
--Many of the factors that have affected petroleum also have restricted the development of new domestic gas reserves. In addition, regulations have kept gas wellhead prices below competitive levels.
--In 1972, the FPC instituted new procedures whereby producers and buyers may negotiate higher than ceiling prices for gas not committed to markets before April 6, 1972.
--Drilling has increased and there is some optimism that the long downtrend may have been reversed.
--Further details on natural gas are in the Appendix.

Fig. 10

U.S. SUPPLIES AND USES OF COAL

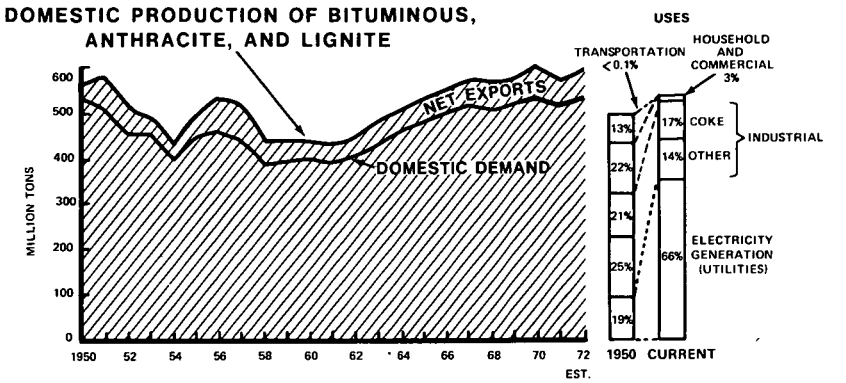
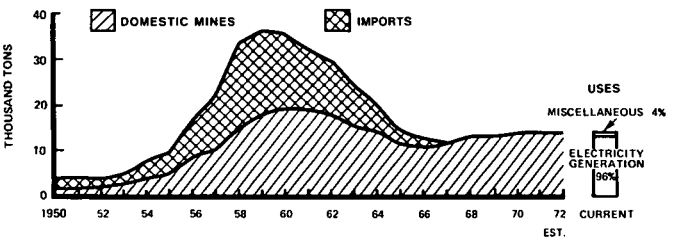


Fig. 11

U.S. SUPPLIES AND USES OF URANIUM (U_3O_8)



COAL (BITUMINOUS, ANTHRACITE, LIGNITE)

$5.5 BILLION (EST.)
148,000 EMPLOYEES

--Domestic production of coal in 1972 totaled 597 million short tons, valued at almost $4.5 billion. Output was only about 6 percent more than in 1971, during which a prolonged work stoppage resulted in a drop of 52 million tons from 1970 production.
--Environmental constraints on the use of high-sulfur fuels, coupled with rising production costs and competition from imported residual fuel oil in the East and nuclear power, are deterring growth in coal capacity east of the Mississippi River where most of coal's markets are located.
--Production is being maintained only because older utility plants are not yet subject to State Implementation Plans of the Environmental Protection Agency.
--There is an increasing flow of low-sulfur, lower heating value western coals to the Midwest, but high transportation charges prohibit their use in the East.
--Low-sulfur bituminous coals in the East are used principally for metallurgical purposes and for export, but they are relatively limited and expensive for steam electric use which accounts for two-thirds of domestic coal consumption.
--The value of steam coals, coke, and coal chemicals produced in 1972 was an estimated $5.5 billion. Coal and coke exports made a positive contribution to the U.S. balance of trade of $1 billion.
--Additional information on coal is in the Appendix.

URANIUM (U_3O_8)

$153 MILLION
7,000 EMPLOYEES

--Mill production of uranium in 1972 was 12,300 short tons, valued at $153 million. Output was about the same as in 1971. The U.S. average price was $6.20 per pound, a slight decrease from 1971.
--Since the Atomic Energy Commission (AEC) ceased purchases of uranium in 1970 the industry has been operating in a wholly commercial market characterized by a general world oversupply situation.
--Contributing to the weak market have been delays in the nuclear power program mainly because of environmental considerations, rising costs, and problems in construction.
--Lack of strong demand has resulted in generally curtailed exploration for new uranium reserves.
--Mid-to long-term market conditions are expected to improve as new nuclear power plants come on line.
--As of December 31, 1972, there were 29 operable plants in the United States, 55 were being built, and 76 were planned with reactors ordered.
--Other developments in 1972 included: (1) planning by the AEC and industry for design and construction of a demonstration fast breeder reactor; (2) the first proposals by private industry to produce enriched uranium for nuclear fuel, and (3) an announced plan by the AEC whereby it intends to convert the excess U_3O_8 stockpile, estimated at 50,000 tons, to an enriched uranium reserve.
--Additional information on uranium is in the Appendix.

Fig. 12

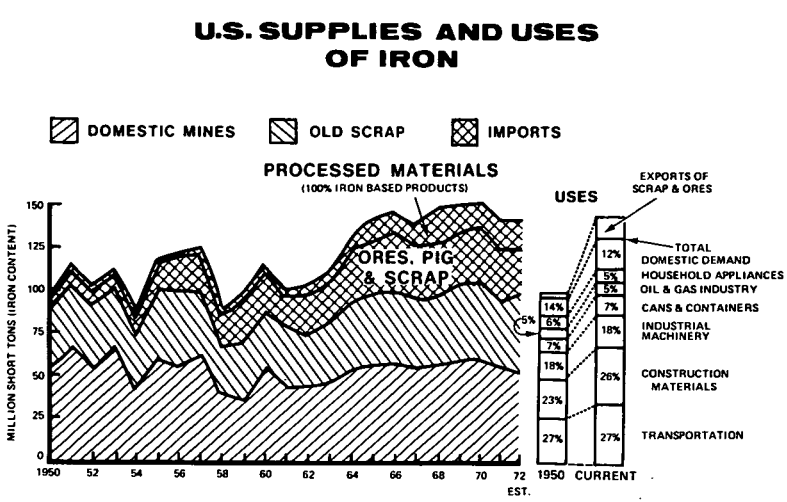
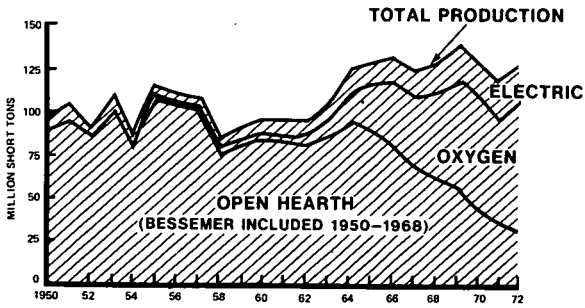

U.S. SUPPLIES AND USES OF IRON
DOMESTIC MINES
OLD SCRAP
IMPORTS
PROCESSED MATERIALS
(100% IRON BASED PRODUCTS)
ORES, PIG & SCRAP
MILLION SHORT TONS (IRON CONTENT)
150
125
100
75
50
25
0
1950
52
54
56
58
60
62
64
66
68
70
72
EST.
5%
USES
EXPORTS OF SCRAP & ORES
TOTAL DOMESTIC DEMAND
HOUSEHOLD APPLIANCES
OIL & GAS INDUSTRY
CANS & CONTAINERS
INDUSTRIAL MACHINERY
CONSTRUCTION MATERIALS
TRANSPORTATION
14%
6%
7%
18%
23%
27%
12%
5%
5%
7%
18%
26%
27%
1950
CURRENT

Fig. 13


U.S. PRODUCTION OF RAW STEEL BY FURNACE TYPE
TOTAL PRODUCTION
ELECTRIC
OXYGEN
OPEN HEARTH
(BESSEMER INCLUDED 1950–1968)
MILLION SHORT TONS
150
125
100
75
50
25
0
1950
52
54
56
58
60
62
64
66
68
70
72

FERROUS METALS

$27 BILLION
870,000 EMPLOYEES

Iron and its alloys are generally considered to be the backbone of any industrialized civilization. Tall buildings, major bridges, ships, vehicles, industrial machinery, and a wide variety of consumer goods are made largely of iron. Steel is produced in response to commercial demand. Consequently, iron ore mining, scrap recovery and imports of ores are in turn largely responsive to steel production. Raw steel production in 1972 increased about 10 percent to 133 million short tons. The "Use" bar graph on Figure 12 shows that transportation and construction materials, each take about one-fourth of domestic steel while a number of other uses, mostly industrial machinery, takes the remainder. In addition to construction, steel production is particularly attuned to domestic auto production, as each standard size auto requires nearly two tons of steel.

Figure 12 shows that domestic iron ore production, including that derived from concentrating domestic taconites, has stabilized; recovery of old iron (ferrous) scrap, which includes prompt industrial and obsolete scrap, continues to be a major contributor to domestic iron supplies.

Figure 12 also shows that the gradual increase in United States demand for iron has been met largely by imports of both raw and processed materials. Iron ore imports have increased over the years but the recent rapid rise in the imports of processed iron and steel materials, which in 1971 exceeded 18 million tons, has been the cause of much concern. These imports were held to slightly under 18 million tons during 1972 as a result of the 3-year quota agreement worked out with Japan and the European Common Market to limit the annual growth of imports of processed steel. Other measures were also included in the agreement which were of great benefit to producers of speciality and stainless steel by making it more difficult to concentrate imports in higher-priced, higher-profit products.

The 1972 estimated value of output and employment for important segments of the domestic iron and steel industry were as follows:

Iron ore production	$0.9 billion	20,000 Employees
Old scrap production	$1.5 billion	40,000 Employees
Steel mill products	$19.2 billion	475,000 Employees
Ferrous castings	$5.3 billion	218,000 Employees

The value of iron in foreign trade did not significantly change in 1972.

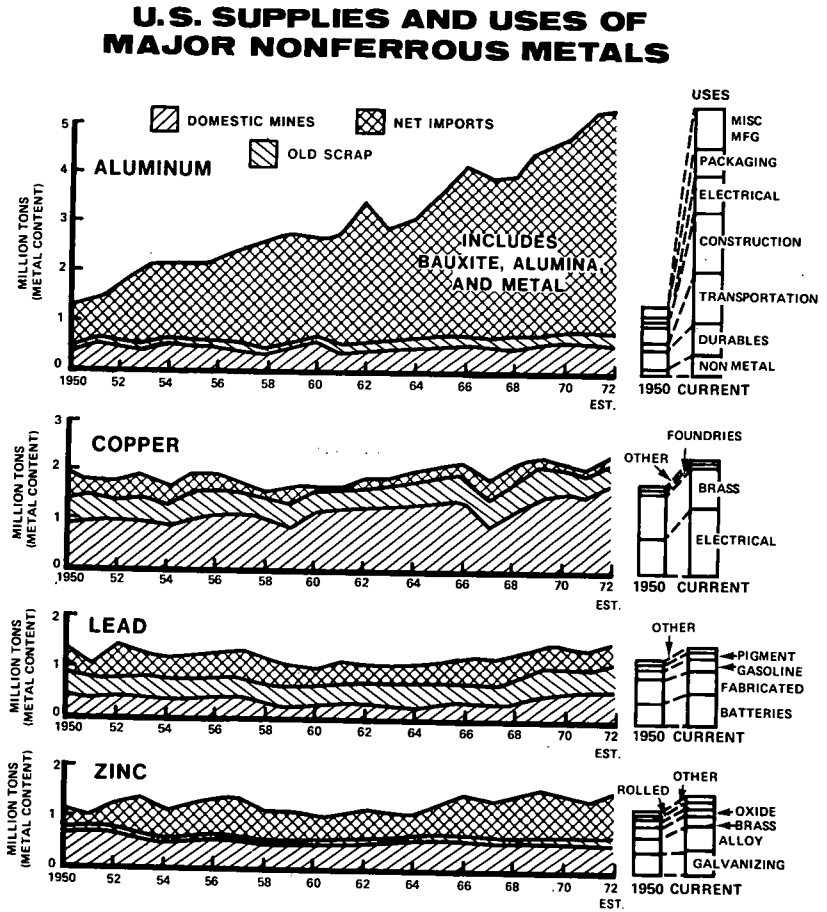
Imports of iron ore were	$0.4 billion
Imports of iron and steel processed materials were	$3.0 billion
Exports of ore, scrap, and steel were about.....	$1.3 billion

This resulted in a negative balance of trade for iron in 1972 of over $2 billion.

The United States production of raw steel by furnace type has changed significantly over the past two decades. As shown in Figure 13 the oxygen furnace has replaced the open hearth as the major source of raw steel production. In 1950 the open hearth produced 96 percent of the raw steel produced, while currently the open hearth accounts for only 26 percent. Replacement of open hearths by oxygen furnaces tends toward a decrease in scrap consumption which however is offset by increased steel production in electric furnaces, which are capable of using a large percentage of scrap.

Steelmaking uses large quantities of coke and limestone. Also required are a variety of ferro-alloys, including manganese, chromium, molybdenum, vanadium, tungsten, silicon, nickel, cobalt, columbium and tantalum; and refractory materials, including chromite, magnesite, kyanite, mullite, graphite, bauxite and zirconia. (See these materials in Appendix "I".)

Fig. 14


U.S. SUPPLIES AND USES OF MAJOR NONFERROUS METALS
DOMESTIC MINES
NET IMPORTS
OLD SCRAP
ALUMINUM
MILLION TONS (METAL CONTENT)
INCLUDES BAUXITE, ALUMINA AND METAL
1950 52 54 56 58 60 62 64 66 68 70 72 EST.
USES
MISC MFG
PACKAGING
ELECTRICAL
CONSTRUCTION
TRANSPORTATION
DURABLES
NON METAL
1950 CURRENT
COPPER
FOUNDRIES
OTHER
BRASS
ELECTRICAL
LEAD
PIGMENT
GASOLINE
FABRICATED
BATTERIES
ZINC
ROLLED
OXIDE
BRASS
ALLOY
GALVANIZING

$5.1 BILLION (EST.)
90,000 EMPLOYEES

PLASTICS (DERIVED CHIEFLY FROM PETROLEUM AND NATURAL GAS RAW MATERIALS)

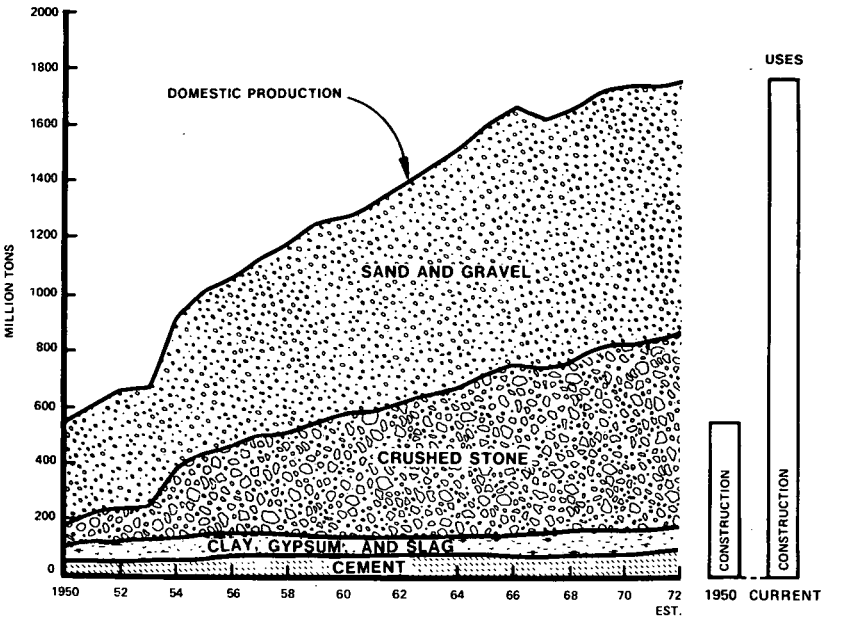
Production of domestic plastics materials and resins has grown at an average rate of almost 12 percent annually for the past decade, although there have been considerable year-to-year variations. Output in 1972 was an estimated 23.6 billion pounds, almost 20 percent higher than in 1971. Product shipments in 1972 were valued at over $5.1 billion, as estimated by the Department of Commerce. The value of exports was $696 million, about 6 percent more than in 1971. Imports, which have been increasing faster percentage-wise than exports, were valued at about $160 million. Thus, plastics exports contributed a positive $536 million to the U.S. balance of trade. The United States reportedly produces about 30 percent of the world's plastics; however, its share has been declining as more facilities go on stream in other countries.

Apparent domestic consumption of plastics in 1972 was approximately 22 billion pounds, or about 100 pounds for each person in the United States. Strong growth in plastics is expected to continue for several years as existing markets are further expanded and new ones are opened. Plastics are being substituted increasingly for metals, wood, paper products, glass, and natural fibers and materials. Major markets are packaging, construction, transportation equipment, and appliances. The furniture manufacturing market is relatively small but is growing rapidly. The housing and automobile markets were particularly strong in 1972. The average 1973-model car may use 125 pounds or more of plastics compared with 110 pounds in 1972 cars. The automobile industry uses more than one billion pounds of plastics annually.

Some threats to the rapid growth in plastics include disposal problems, the trend toward smaller automobiles, higher equipment and materials costs, and saturation in some markets such as textiles. Plastics materials contribute about 2 percent of municipal solid wastes, according to the Department of Commerce. Developments to reduce waste problems include investigations of degradable plastics, incineration techniques, and recycling.

Fig. 16

U.S. SUPPLIES AND USES OF MAJOR NONMETALLIC CONSTRUCTION MATERIALS



NONMETALLIC CONSTRUCTION MATERIALS

$21 BILLION
790,000 EMPLOYEES

The use of nonmetallic construction materials continued to increase in 1972. Figure 16 shows that the use of nonmetallics has more than tripled over the past two decades. The materials covered in Figure 16 are produced almost wholly within the United States from plentiful reserves. While nationally, reserves for most of these materials are more than adequate, local shortages do occur. Local shortages of sand, gravel or crushed stone may occur as a result of zoning or environmental regulations. Current output from the nonmetallic mining industries, (consisting mostly of construction materials) was valued over $3 billion and employed about 150,000 people.

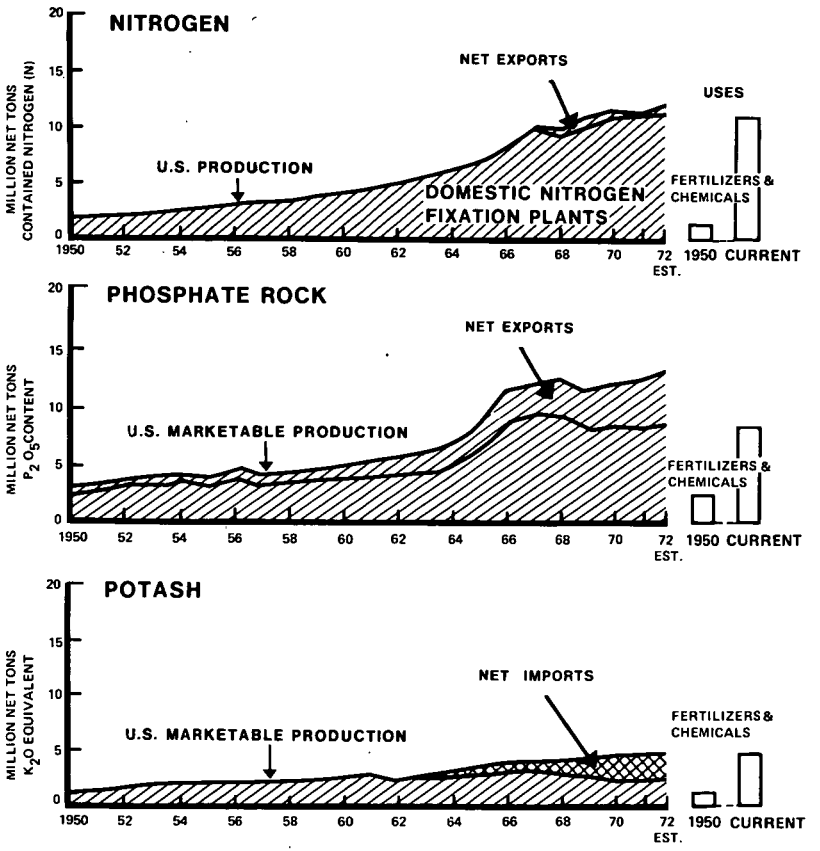
During 1972, there were regional shortages of cement, which were most directly attributable to high levels of construction activity in some parts of the nation. As a result, during 1972 U.S. imports of cement were greater than in 1971. The cement industry has recently spent substantial amounts of money for environmental protection.

For the most part the value or contribution of the nonmetallic mining industry to the U.S. economy is reflected in the use of cement, stone, and sand and gravel, for foundations, bridges, buildings, airports, roads, dams, etc. In 1972 nonmetallic raw materials were used to produce stone, clay and glass products employing 640,000 people and valued at $18 billion. Some of these products include clays such as tile, pipe and ceramics for construction as well as gypsum plasterboard.

The opportunities for recycling nonmetallics are not great. There are some opportunities for reuse of old brick, reuse of building rubble as construction fill and the use of cullet (glass scrap) to make new glass. For information regarding other nonmetallics, see Appendix "I."

Fig. 17

U.S. SUPPLIES AND USES OF MAJOR FERTILIZERS



$2.0 BILLION
34,500 EMPLOYEES

FERTILIZER MATERIALS

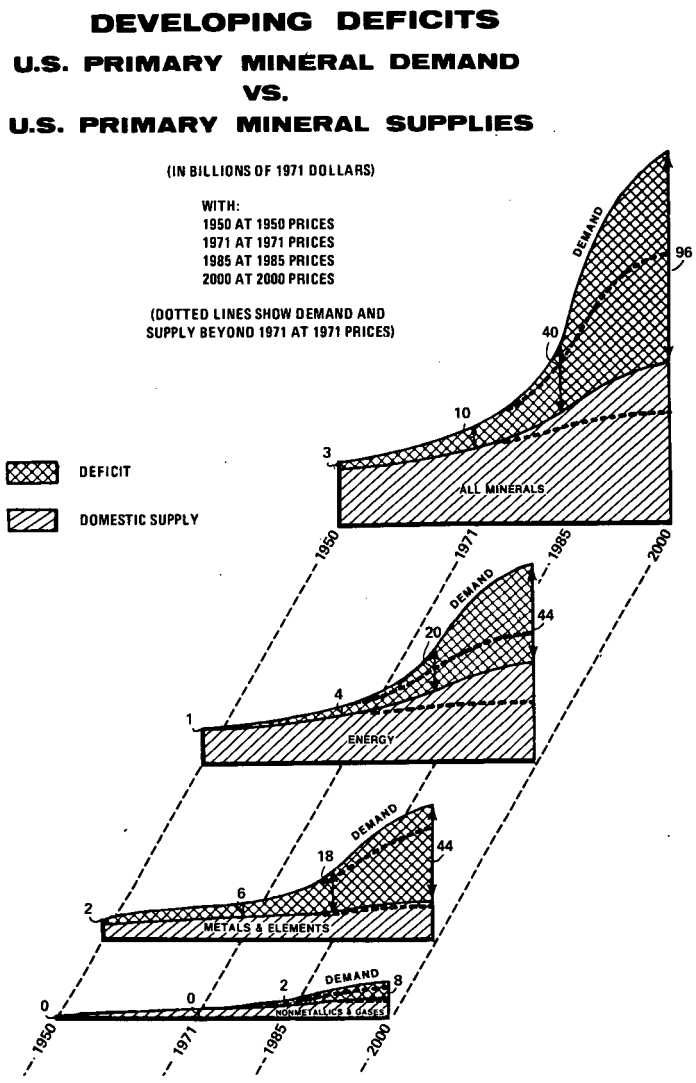
Figure 17 shows the continued increase over the past two decades of the three major fertilizer ingredients nitrogen, phosphorus, and potash (N-P-K). Our increased agricultural productivity results in significant degree from the intensive application of N-P-K, along with many other trace elements. In 1972, 7,000 people produced $455 million worth of crude fertilizer materials which were processed by 27,500 people into $1.9 billion worth of fertilizers.

Both production and consumption of nitrogen (fixed) increased slightly in 1972. Nitrogen is recovered from the atmosphere; therefore, reserves are unlimited. In 1972, the U.S. domestic nitrogen industry became more efficient as numerous small and inefficient plants were closed. Demand for nitrogen as a refrigerant in food processing and preservation increased.

The production of phosphate rock and the consumption of phosphates continued to increase in 1972. Larger quantities of phosphates were consumed as a result of the continued increase in the use of high-analysis products, such as triple superphosphate rather than the normal superphosphates. Export demand also continued strong both for phosphate rock and chemical fertilizers. Domestic reserves of phosphate are large but problems of waste disposal, pollution control, land reclamation, and transportation must be solved in order to maintain the domestic industries export markets. Waste phosphate slime disposal is a major problem in Florida. The Department of the Interior is giving high priority to research intended to help solve the phosphate slime disposal problem.

Consumption of potash in 1972 increased slightly to 4.9 million short tons compared with 4.8 million in 1971. About 95 percent of the potash consumed in the United States is used in fertilizers. United States dependence on imports continued as imports increased and were larger than domestic production for the second consecutive year. Exports also increased, and as a result net imports were virtually unchanged. The United States reserves of potash are large, but currently only a small quantity of these can be economically mined due to competition from vast high-grade deposits in Canada.

Fig. 18



37-143 O - 74 - 27

A LOOK TO THE FUTURE:

When future use patterns are forecast, with consideration of technological and other changes, significant increases in demand for energy, metals, and minerals appear inevitable.

1950 - the U.S. used 2 billion tons of new minerals.
1972 - THE U.S. USED 4 BILLION TONS OF NEW MINERALS.
2000 - THE U.S. WILL NEED 11 BILLION TONS OF NEW MINERALS.

When domestic mineral production patterns of the past decades are projected into the future, increases are indicated. But the forecast demands increase at a greater rate than the projected domestic supplies, so that, as shown by Fig. 18 :

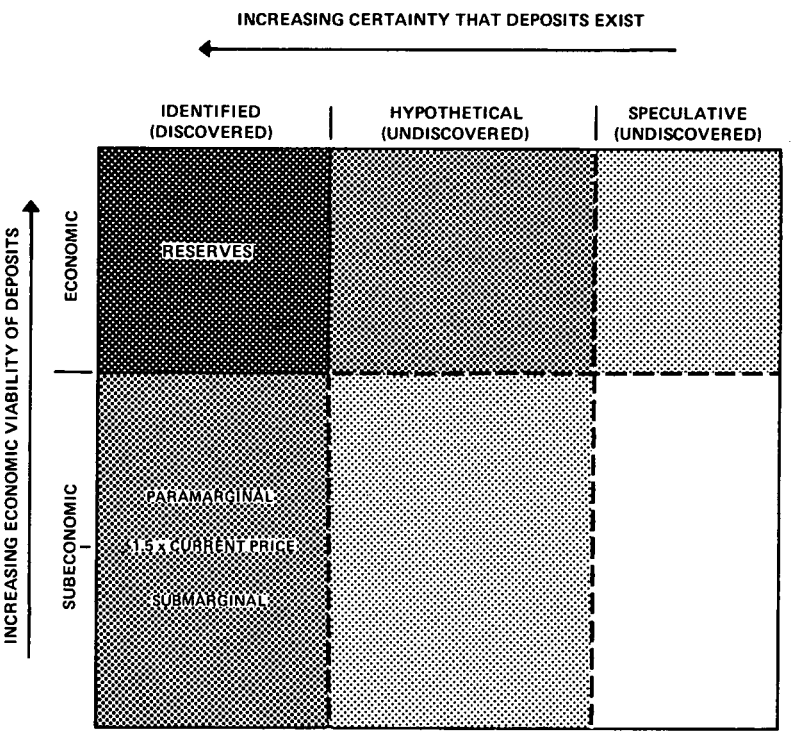
THE 1985 DEFICIT WOULD BE $40 BILLION,
AND
THE 2000 DEFICIT WOULD BE NEARLY $100 BILLION

However, the U.S. resource base is sufficiently large for many important materials to justify the hope that domestic production could be increased beyond the projections of Fig. 18 .

Fig. 19

MINERAL RESOURCE DIAGRAM

CATEGORIES OF MINERAL RESOURCES



RESERVES AND RESOURCES

The mineral resource position of the United States is basically sound, but continually developing mineral technology, successful exploration, and a sound economic climate are needed to convert natural resources to usable reserves. In appraisals of mineral resources, a distinction must be made between the limited category called "Reserves" and the much broader designation of "Resources."

"Reserves" are mineral deposits that have been reasonably well identified and that are sufficiently rich in grade to be worked profitably under existing economic conditions. "Reserves" are a small portion of total "Resources" as shown in the dark upper left area of Fig. 19. Reserves generally constitute only a working inventory. For most commodities sufficient exploratory work is done to establish a 10-year to 20-year reserve. Consequently, data on reserves bears virtually no relationship to total mineral resources in the ground, or to amounts of mineral resources that may ultimately be recovered. Thus, reserve data are important only for the near future. Reserve data on each important mineral are included in Items 6 of the Appendix I.

"Resources" include "Reserves," and also "Identified Subeconomic Resources," "Hypothetical Resources," and "Speculative Resources," as shown in the lighter areas of Fig. 19. "Identified Subeconomic Resources" are those that are known, but are too low in grade to be economic now. However, improvements in mineral technology can move them into the reserve category. "Hypothetical Resources" have not yet been discovered, but are geologically predictable in known mineral districts. Increased exploration activity and new earth science theory and methods can move these resources into identified categories. A further category of undiscovered resources - "Speculative Resources" - occurs in other than known mineral districts. The possibility that speculative resources exist in a given region must be judged by broad geologic similarities or by statistical relationships with known mineral districts. The lack of known deposits in such regions thought to have resource potential limits our ability to estimate specific volumes of speculative resources. The area of speculative resources lies to the right of hypothetical resources in Fig. 19. Looking to the future, for the middle and long-term, "Resource" data are vastly more significant than "Reserve" data. The great bulk of undiscovered mineral resources from which future supplies will be drawn are the "Hypothetical Resources." The table on the next page is a summary of our current knowledge, and additional details are provided in Appendix II.

Table 1. Resources of Selected Mineral Commodities

Mineral Commodity	Identified Resources 1/	Hypothetical Resources 2/	Mineral Commodity	Identified Resources 1/	Hypothetical Resources 2/
Aluminum	Very Large	KDI	Mercury	SMALL	KDI
Antimony	SMALL	SMALL	Mica		
Asbestos	SMALL	INSIGNIFICANT	Sheet	INSIGNIFICANT	Very Large
Barite	Very Large	Very Large	Scrap & Flake	Huge	Huge
Beryllium	Very Large	Huge	Molybdenum	Huge	Huge
Boron	Very Large	Huge	Natural Gas	Moderate	Large
Bromine	Huge	Huge	Nickel	Large	KDI
Calcium Chloride (Brine)	Very Large	Huge	Nitrogen	Huge	Huge
			Peat	Huge	KDI
Chlorine	Huge	Huge	Petroleum		
Chromium	INSIGNIFICANT	INSIGNIFICANT	Liquids	Large	Large
Clay	Large	Very Large	Phosphate	Very Large	Huge
Coal	Huge	Huge	Platinum Group	Moderate	Large
Construction Stone:			Potash	Very Large	Huge
Crushed	Large	KDI	Rare Earths	Huge	KDI
Dimension	Large	KDI	Salt	Huge	Huge
Copper	Large	Large	Sand & Gravel	Large	KDI
Diatomite	Huge	KDI	Silver	Moderate	Large
Feldspar	Huge	Huge	Sodium Carbonate		
Fluorine	SMALL	SMALL	& Sulfate	Huge	Huge
Gold	Large	KDI	Strontium	Huge	Huge
Graphite	Very Large	KDI	Sulfur	Huge	Huge
Gypsum	Huge	Huge	Talc	Very Large	Huge
Iodine	Very Large	Huge	Thorium	Very Large	KDI
Iron	Very Large	Huge	Tin	INSIGNIFICANT	INSIGNIFICANT
Kyanite	Huge	Huge	Titanium	Very Large	Very Large
Lead	Large	Moderate	Tungsten	Moderate	Moderate
Limestone			Uranium	Large	Large
& Dolomite	Large	KDI	Vanadium	Very Large	KDI
Lithium	Huge	Huge	Zeolites	Huge	Huge
Magnesium	Huge	Huge	Zinc	Very Large	Very Large
Manganese	Large	KDI	Zirconium	Large	KDI

1/ IDENTIFIED RESOURCES are defined as including reserves and materials other than reserves which are reasonably well known as to location, extent and grade and which may be exploitable in the future under more favorable economic conditions or with improvements in technology.

2/ HYPOTHETICAL RESOURCES are undiscovered, but geologically are predictable deposits of materials similar to identified resources.

1/ 2/ RESOURCE APPRAISAL TERMS

Huge - Domestic resources (of the category shown) are greater than ten times the minimum anticipated cumulative demand (MACD) between the years 1968 and 2000.

Very Large - Domestic resources are two to ten times the MACD.

Large - Domestic resources are approximately 75 percent to twice the MACD.

Moderate - Domestic resources are approximately 35 percent to 75 percent of the MACD.

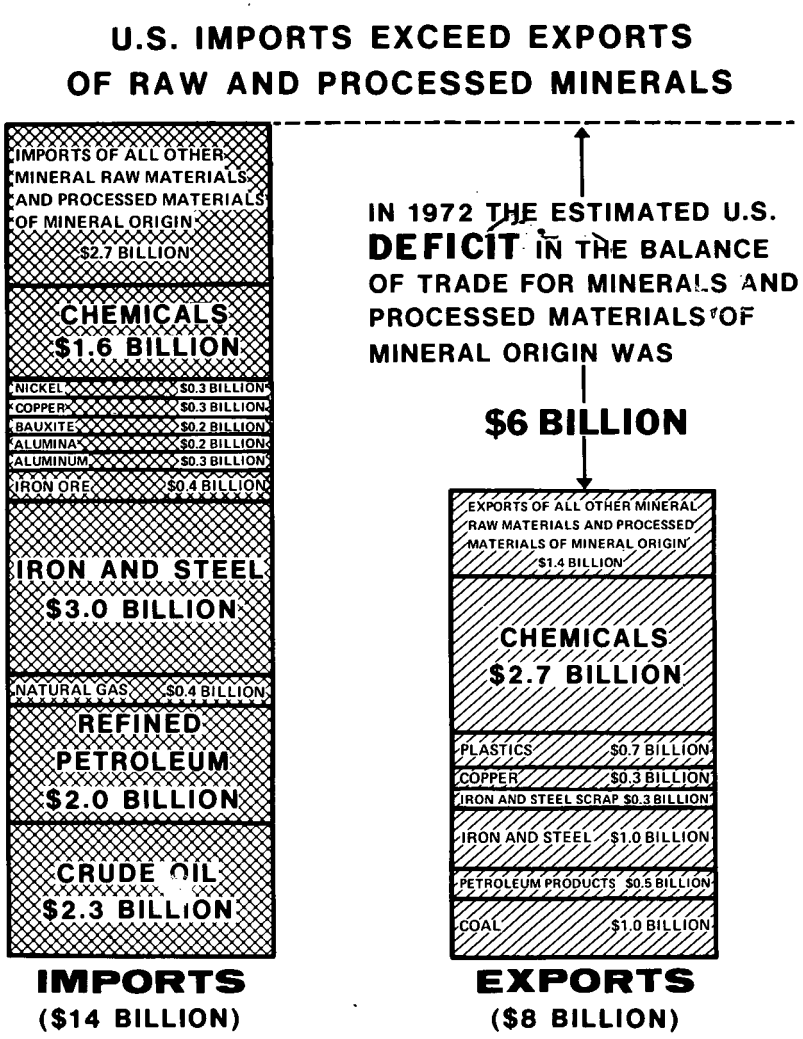
SMALL - Domestic resources are approximately 10 percent to 35 percent of the MACD.

INSIGNIFICANT - Domestic resources are less than 10 percent of the MACD.

KDI - (Known data insufficient)--Resources not estimated because of insufficient geologic knowledge of surface or subsurface areas.

MAJOR PROBLEMS
WHICH PRESENTLY CONFRONT
THE MINING, MINERALS, METAL,
MINERAL RECLAMATION, AND
ENERGY INDUSTRIES
AND
THE U.S. GOVERNMENT

Fig. 20


U.S. IMPORTS EXCEED EXPORTS
OF RAW AND PROCESSED MINERALS
IMPORTS OF ALL OTHER MINERAL RAW MATERIALS AND PROCESSED MATERIALS OF MINERAL ORIGIN
$2.7 BILLION
CHEMICALS
$1.6 BILLION
NICKEL $0.3 BILLION
COPPER $0.3 BILLION
BAUXITE $0.2 BILLION
ALUMINA $0.2 BILLION
ALUMINUM $0.3 BILLION
IRON ORE $0.4 BILLION
IRON AND STEEL
$3.0 BILLION
NATURAL GAS $0.4 BILLION
REFINED PETROLEUM
$2.0 BILLION
CRUDE OIL
$2.3 BILLION
IMPORTS
($14 BILLION)
IN 1972 THE ESTIMATED U.S. DEFICIT IN THE BALANCE OF TRADE FOR MINERALS AND PROCESSED MATERIALS OF MINERAL ORIGIN WAS
$6 BILLION
EXPORTS OF ALL OTHER MINERAL RAW MATERIALS AND PROCESSED MATERIALS OF MINERAL ORIGIN
$1.4 BILLION
CHEMICALS
$2.7 BILLION
PLASTICS $0.7 BILLION
COPPER $0.3 BILLION
IRON AND STEEL SCRAP $0.3 BILLION
IRON AND STEEL $1.0 BILLION
PETROLEUM PRODUCTS $0.5 BILLION
COAL $1.0 BILLION
EXPORTS
($8 BILLION)

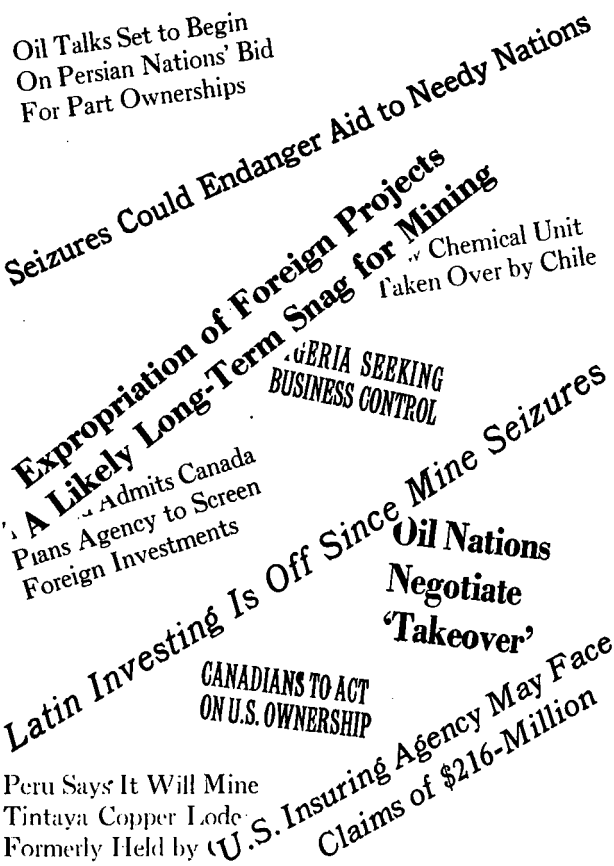
PROBLEM: Mineral imports have an unfavorable impact upon the U.S. balance of trade and upon the U.S. balance of payments.

Fig. 20 details the $6 billion deficit in the 1972 mineral balance of trade. (Item 9 in each mineral profile in Appendix I gives details.)

It is difficult to estimate the balance of payments impact, as distinct from the balance of trade, because an adequate statistical base does not exist. For example: profits from foreign operations are difficult to determine. Nevertheless, an unfavorable balance of trade is a factor which may tend toward an unfavorable balance of payments.

SOLUTION: A combination of:
orderly development of domestic mineral resources, vigorous promotion of exports of minerals and mineral-based products, and, in certain cases, temporary limitation of excessive imports may help to ameliorate the balance of trade problem.

EXPROPRIATIONS, CONFISCATIONS, AND FORCED MODIFICATIONS OF AGREEMENTS HAVE SEVERED THE FLOW TO U.S. OF SOME FOREIGN MATERIALS PRODUCED BY U.S. FIRMS OPERATING ABROAD, AND HAVE MADE OTHER MATERIALS MORE COSTLY.



PROBLEM: Expropriations, confiscations, and forced modifications of agreements have severely modified the flow to the United States of some foreign mineral materials produced by U.S. firms operating abroad, and have made other materials more costly.

Foreign nations naturally wish to receive the maximum possible benefits from their raw materials.

Foreign nations wish to create additional employment possibilities and to earn the "value added by manufacturing" wherever possible. (Examples: selling steel instead of iron ore, aluminum instead of bauxite, and refined petroleum instead of crude oil.)

Underdeveloped nations and nations hoping to industrialize are becoming increasingly conscious that mineral resources may be more valuable in the future. Therefore, some are limiting exports.

For political reasons sometimes impossible to evaluate on an economic basis, some foreign countries express their displeasure with the policies of others by cutting off the flow of materials.

SOLUTION: Orderly development of domestic mineral resources may reduce dependence upon potentially unreliable foreign materials.

MAJOR MINERAL EXPORTING BLOCS:

OPEC = ORGANIZATION OF PETROLEUM EXPORTING COUNTRIES:

VENEZUELA, INDONESIA, LIBYA, ALGERIA, NIGERIA, SAUDI ARABIA, KUWAIT, QUATAR, ABU DHABI, IRAN, IRAQ.

CIPEC = INTERGOVERNMENTAL COUNCIL OF COPPER EXPORTING COUNTRIES:

CHILE, PERU, ZAMBIA, ZAIRE.

ITC = INTERNATIONAL TIN COUNCIL:

PRODUCERS: MALAYSIA, BOLIVIA, INDONESIA, NIGERIA, ZAIRE, AUSTRALIA.

CONSUMERS: JAPAN, UNITED KINGDOM, FRANCE, WEST GERMANY, U.S.S.R., ITALY, NETHERLANDS, INDIA, CANADA, POLAND, CZECHOSLOVAKIA, BELGIUM, SPAIN, YUGOSLAVIA, HUNGARY, DENMARK, BULGARIA, AUSTRIA, REPUBLIC S. KOREA.

MAJOR SUPRA-NATIONAL INDUSTRIAL BLOCS:

COMMON MARKET = FRANCE, WEST GERMANY, ITALY, BELGIUM, NETHERLANDS, LUXEMBOURG, UNITED KINGDOM, DENMARK, IRELAND.

COMECON = COUNCIL FOR MUTUAL ECONOMIC ASSISTANCE:

BULGARIA, CZECHOSLOVAKIA, EAST GERMANY, HUNGARY, ROMANIA, POLAND, U.S.S.R., MONGOLIA.

PROBLEM: U.S. industry is encountering greater competition from foreign nations and supranational groups in developing new foreign mineral supplies and in assuring the long-term flow of minerals to the United States.

U.S. firms operate in foreign nations on a private basis, whereas many other foreign nations have mechanisms for government assistance as exemplified by the Ministry of International Trade and Industry of Japan, the Bureau de Recherches Geologiques et Minieres of France, and the State Trading Organizations of the U.S.S.R. Appendix VIII provides additional details.

Nations with centrally planned economies, such as those in the COMECON, often make barter deals and country-to-country trade agreements, both with each other and with outside nations. Thus, normal competition by individual U.S. firms is more difficult or impossible.

Moreover, as listed on the opposite page, several supranational groups are involved with minerals and have agreements which impede normal competition by U.S. firms.

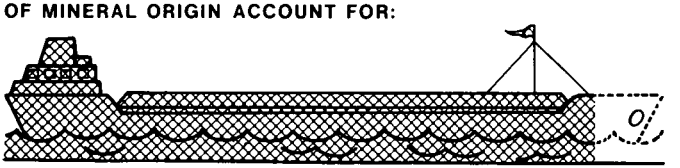
SOLUTION: Orderly development of domestic mineral resources may reduce dependence upon potentially unreliable foreign materials. Also, new mechanisms to permit U.S. firms to operate more effectively in the foreign field should be explored.

Fig. 21

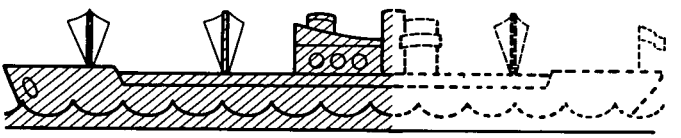
MINERALS ARE MAJOR TRANSPORTATION USERS

MODERNIZATION OF THE U.S. TRANSPORTATION NET IS ESSENTIAL TO IMPROVEMENT OF OUR MINERAL POSTURE

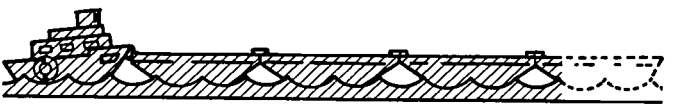
MINERALS AND PROCESSED MATERIALS
OF MINERAL ORIGIN ACCOUNT FOR:



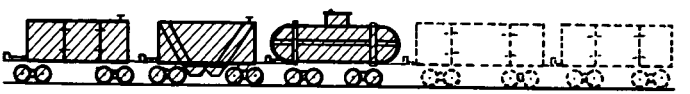
90% OF ALL U.S. WATERBORNE IMPORTS



60% OF ALL U.S. WATERBORNE EXPORTS



85% OF ALL DOMESTIC WATERBORNE COMMERCE



60% OF ALL DOMESTIC RAIL SHIPMENTS

100% OF ALL DOMESTIC PIPELINE MOVEMENTS

PROBLEM: Development of the U.S. transportation net is not keeping pace with demand, thus seriously affecting the energy and minerals industries.

Fig.21 shows the dependence of the U.S. mineral industry upon transportation.

The 4 billion tons of minerals mined annually must be moved to processing plants and to ultimate consumers.

Needed are improved:

Deepwater ports for large oil-ore-grain bulk carriers;
Railroad roadbeds and specialized railroad cars;
Pipeline systems;
Inland waterways; and
Storage facilities.

Most transportation is currently under Government regulation, and much is subsidized.

SOLUTION: To provide reliable transportation at reasonable costs for the mining, minerals, metal, mineral reclamation, and energy industries, industry and government must intensify development of coordinated plans for efficient handling of large volumes of low-value materials such as mineral fuels and ores. Deep-water ocean ports for deepdraft ore-oil-grain bulk carriers, and improved domestic rail, barge, and pipeline systems are needed.

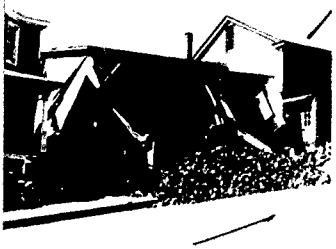
RECLAMATION OF MINED LAND

SURFACE MINING

RESTORING STRIPPED LANDS

ABANDONED QUARRY

RECLAIMED GRAVEL PIT



DAMAGE FROM MINE SUBSIDENCE

BACKFILLING TO PREVENT MINE SUBSIDENCE

PROBLEM: Removal of billions of tons of minerals annually from the earth contributes to a variety of disturbances.

Surface mining - accounting for nearly 90 percent of total mineral production - normally requires disturbance of top soil, removal of overlying strata, and creation of spoil banks.

In areas of moderate to heavy rainfall disturbed land is more easily percolated by water, resulting in ground-water and surface-water contamination.

Underground caving in deep mines may eventually reach to the surface and cause subsidence. Withdrawal of fluids such as oil and water can also cause subsidence.

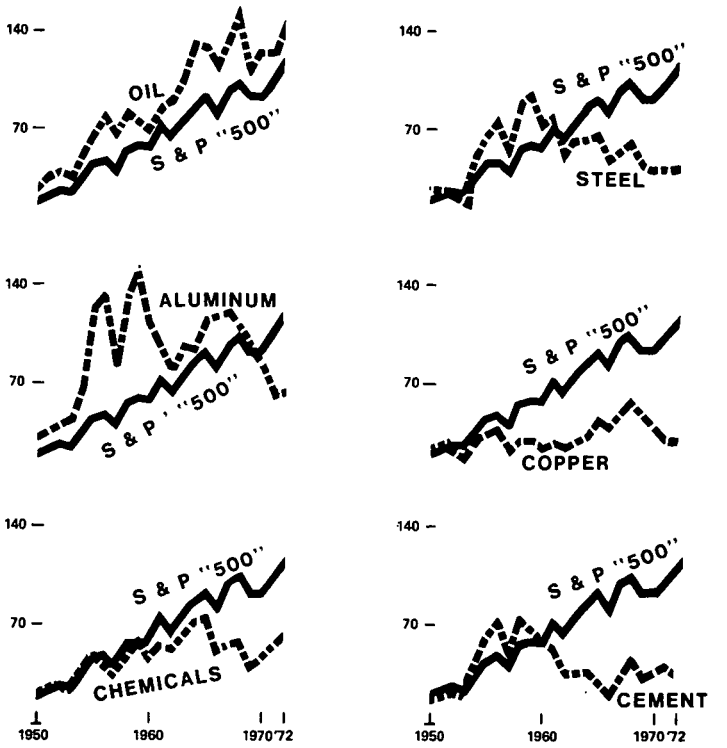
Restored mined lands can have better contours and may be more valuable for agricultural, recreational, or building purposes than the original virgin land.

SOLUTION: The Administration recently proposed legislation, S. 923 and H.R. 4863, to provide for cooperation between the Federal Government and the States with respect to environmental regulations for mining operations, and for other purposes. In addition, the Government is sponsoring several pilot projects intended to restore mined lands for recreational purposes, and it has a number of other active projects related to mine subsidence, mine fires, culm, etc., as described in Appendix VI.

Fig. 22

OVER THE PAST DECADE STEEL, COPPER, CHEMICALS, AND CEMENT STOCK PRICES HAVE LAGGED THE STANDARD & POOR'S "500" INDEX

(NUMBERS ARE INDEXES BASED ON 1941 - 43 = 10)



37-143 O - 74 - 28

PROBLEM: The U.S. mining, minerals, metal, and mineral reclamation industries are encountering increasing difficulty in financing needed expansion of capacity and the introduction of new or improved technology.

In our free enterprise society the stock market is a major barometer of the economic soundness and stability of industries.

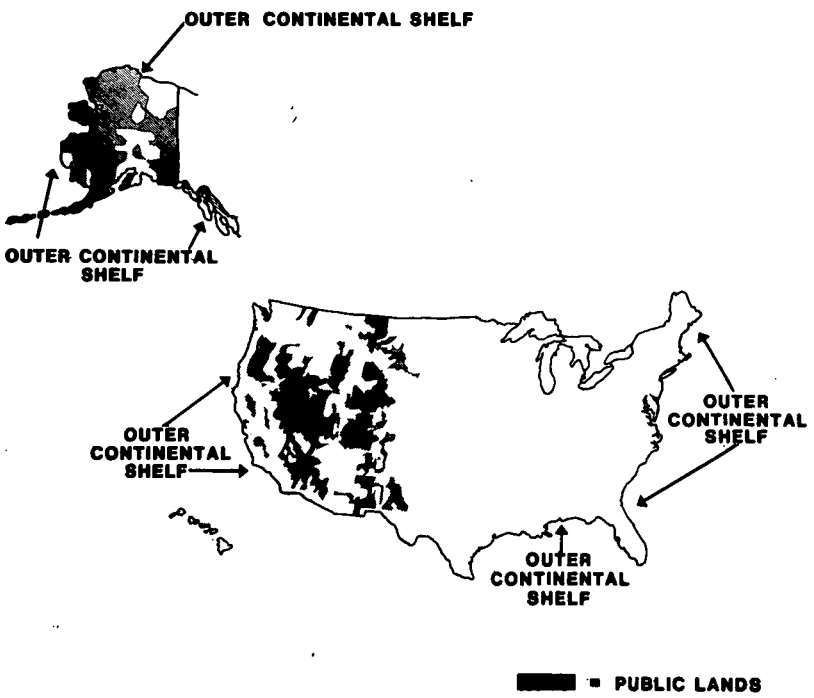
Fig. 22 shows that major segments of the minerals industry do not appear to have kept pace with the economy, and that other fields appear to offer more opportunities for profits.

Over the past decade, debt-equity ratios have increased, liquidity has dropped, and expenditures for new plant and equipment in some major segments of the minerals industry have not kept pace with demand for minerals and mineral products.

Major segments of the domestic mineral industries are encountering increasing difficulty in financing new developments through stock sales, while, at the same time, financing by borrowing has become more costly.

SOLUTION: Productivity must be increased by developing new and improved technology, and the rapid introduction thereof into industrial practice must be facilitated.

THE U.S. HAS ONLY FRAGMENTARY KNOWLEDGE OF ITS MINERAL RESOURCES, INCLUDING THOSE ON THE PUBLIC LANDS AND OUTER CONTINENTAL SHELVES.



PROBLEM: Management of the resources of the public lands, including the continental shelves, must be improved.

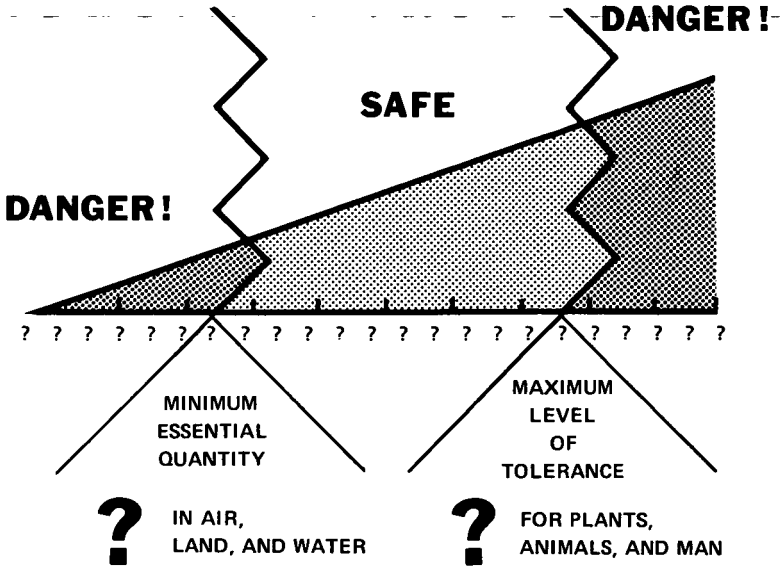
Despite extensive responsibilities, the Congress has never clearly defined the mission of the Bureau of Land Management or the Bureau's authority to accomplish its mission. Unlike the National Park Service and the National Forest Service, the mission and authority of the Bureau of Land Management must be gleaned from some 3,000 land laws which have accumulated over some 170 years. This piecemeal collection of laws is sometimes conflicting and is grossly inadequate. The Bureau does not have essential administrative authority enjoyed by other Federal agencies such as a working capital fund, authority to enforce its rules and regulations and authority to contract with State and local law enforcement agencies for protection of lands under its jurisdiction.

Pressure to reform the Mining Law of 1872 has been growing for many years, both within the mining industry as well as the public at large. Increasing conflicts between mineral activity and other uses of the land, concern for abuses of the mining law to obtain vacation home-sites, concern for environmental protection and the frustration and uncertainty to mineral developers of a complex system of overlapping and archaic location requirements, have contributed to this pressure.

SOLUTION: On February 27, 1973, the Department submitted two bills to improve the management of the public lands:

(1) A bill to provide for the management, protection, development and sale of the natural resource lands, and

(2) A bill to reform the mineral leasing laws.



ACTINIUM	EINSTEINIUM	MENDELEVIUM	SAMARIUM
ALUMINUM	ERBIUM	MERCURY	SCANDIUM
AMERICIUM	EUROPIUM	MOLYBDENUM	SELENIUM
ANTIMONY	FERMIUM	NEODYMIUM	SILICON
ARGON	FLUORINE	NEON	SILVER
ARSENIC	FRANCIUM	NEPTUNIUM	SODIUM
ASTATINE	GADOLINIUM	NICKEL	STRONTIUM
BARIUM	GALLIUM	NITROGEN	SULFUR
BERKELIUM	GERMANIUM	NOBELIUM	TANTALUM
BERYLLIUM	GOLD	OSMIUM	TECHNETIUM
BISMUTH	HAFNIUM	OXYGEN	TELLURIUM
BORON	HELIUM	PALLADIUM	TERBIUM
BROMINE	HOLMIUM	PHOSPHORUS	THALLIUM
CADMIUM	HYDROGEN	PLATINUM	THORIUM
CESIUM	INDIUM	PLUTONIUM	THULIUM
CALCIUM	IODINE	POLONIUM	TIN
CALIFORNIUM	IRIDIUM	POTASSIUM	TITANIUM
CARBON	IRON	PRASEODYMIUM	TUNGSTEN
CERIUM	KRYPTON	PROMETHIUM	URANIUM
CHLORINE	LANTHANUM	PROTACTINIUM	VANADIUM
CHROMIUM	LAWRENCIUM	RADIUM	XENON
COBALT	LEAD	RADON	YTTERBIUM
COLUMBIUM	LITHIUM	RHENIUM	YTTRIUM
COPPER	LUTETIUM	RHODIUM	ZINC
CURIUM	MAGNESIUM	RUBIDIUM	ZIRCONIUM
DYSPROSIUM	MANGANESE	RUTHENIUM	

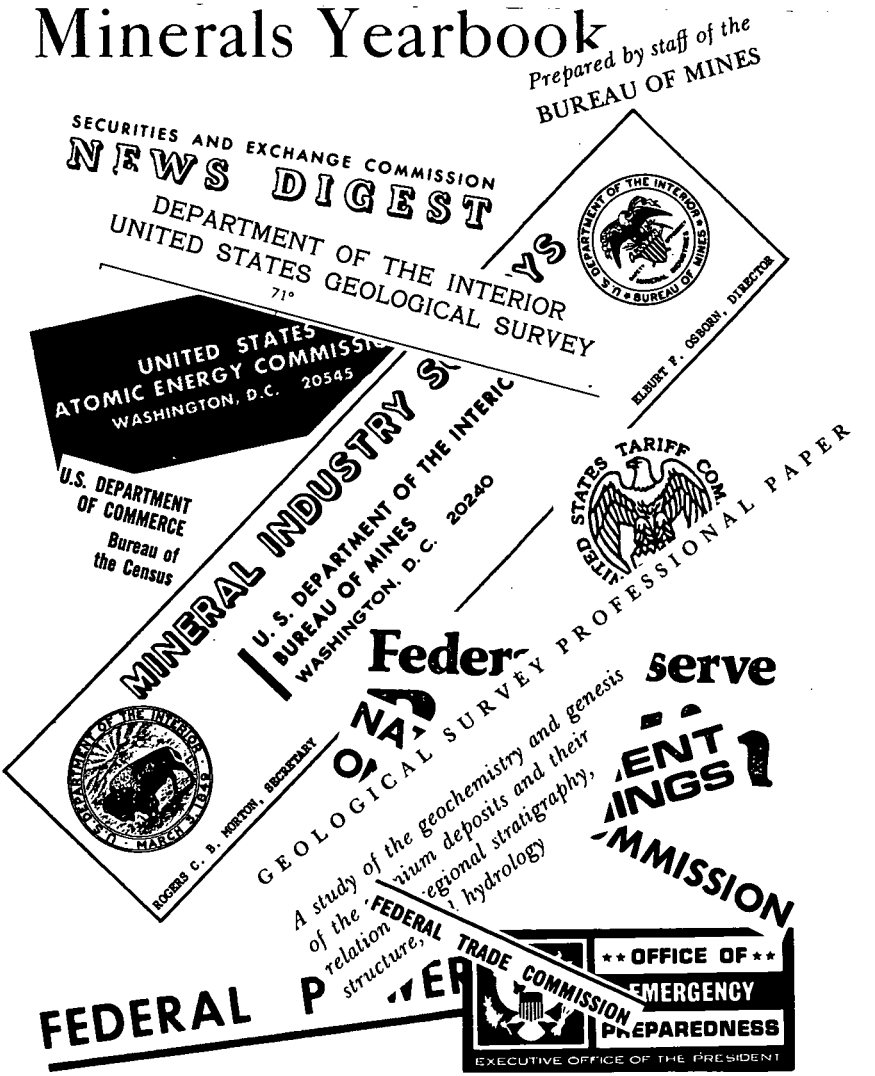
PROBLEM: The factual basis for the formulation and implementation of environmental regulations must be improved, so that man and nature are properly protected with minimum dislocation of important economic activities.

There are more than 100 "elements." However, science has fragmentary knowledge about only 25 of them insofar as: minimum quantities needed by plants, animals, and man for proper growth and to sustain life, and maximum quantities that can be tolerated by plants, animals,and man under different circumstances.

While there are more than 100 elements, there are also literally millions of known compounds containing these elements. Also the background content of air, land, and water must be known, as must patterns of dispersal and assimilation of elements and compounds.

Environmental regulations are being promulgated, often based on only fragmentary evidence, that can have the effect of significantly altering economic activities. The mining, mineral, metal, mineral reclamation, and energy industries, being major emitters of fumes and pollutants, are thus particularly subject to economic disruption.

SOLUTION: To provide accurate information on the possible harmful effects of elements and compounds, scientific agencies should give high priority to the determination of the minimum quantities essential for life and the maximum levels that can be safely tolerated by plants, animals, and man, as well as normal backgrounds and details of emission and absorption mechanisms.


Minerals Yearbook
Prepared by staff of the
BUREAU OF MINES
SECURITIES AND EXCHANGE COMMISSION
NEWS DIGEST
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
ELBERT F. OSBORN, DIRECTOR
UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545
U.S. DEPARTMENT
OF COMMERCE
Bureau of
the Census
MINERAL INDUSTRY
U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON, D.C. 20240
UNITED STATES TARIFF COMMISSION
PROFESSIONAL PAPER
GEOLOGICAL SURVEY
ROGERS C. B. MORTON, SECRETARY
A study of the geochemistry and genesis
of the
relation
structure,
hydrology
FEDERAL TRADE COMMISSION
** OFFICE OF **
EMERGENCY
PREPAREDNESS
EXECUTIVE OFFICE OF THE PRESIDENT
FEDERAL

PROBLEM: The U.S. Government information base for the conduct of its mineral responsibilities is grossly inadequate.

To an ever accelerating degree our government must act promptly on questions of national and international concern involving mineral resources, reserves, production, use, and technology.

Government policies and programs are no better than the data upon which they are based.

In a free society government does not have detailed knowledge of many aspects of research, mineral reserves in private hands, investment plans, process details, etc.

Information on foreign mineral operations is even more fragmentary.

Currently information is scattered among a number of agencies: Interior, Commerce, Treasury, Securities and Exchange Commission, Federal Power Commission, Atomic Energy Commission, etc.

SOLUTION: Government organization must be improved and streamlined, and cooperative measures must be developed so that information available in the public and private sectors can be brought to bear properly upon questions of concern to all.

Chairman PROXMIRE. Now, in your prepared statement you indicate, "For domestic oil and gas reserves the Bureau relies on the annual studies of the American Petroleum Institute (API) and American Gas Association (AGA)."

Mr. RIGG. That is right.

Chairman PROXMIRE. That is the only source of your information is that right?

Mr. RIGG. That is right; those are the industry sources. We also use sources from regional associations and State agencies and from the Internal Revenue Service and various other sources, and then the key to our figures is the capability of our people in the Bureau of Mines to analyze all of these figures and to come up with this best estimate.

Chairman PROXMIRE. The data itself does come from the industry; you do not have any independent way really of gathering except as the industry voluntarily submits it?

Mr. RIGG. That is right.

Chairman PROXMIRE. The extent itself in error, and we had an indication from Senator Nelson earlier of at least one submission was in error by 1,000 percent. There is no way that you can check that?

Mr. RIGG. Well, historically our commodities specialists in the Bureau of Mines have been amazingly accurate.

Chairman PROXMIRE. How do you know?

Mr. RIGG. Because in the final analysis of the figures of preceding years that actually show you what the production and consumption are, they are accurate when you finally check them out to the last decimal point.

Chairman PROXMIRE. You mean right on consumption and production. I do not know how you can tell on reserves.

Mr. RIGG. On reserves, what is the time schedule? We normally use in our Bureau 20 years as the farthest projected in the future for supply. We have a new definition of resources and reserves that Geological Survey and Bureau of Mines have recently completed. I have a copy of it with me. And in this one under measured reserves the statement is said to be accurate within limits which are stated, and no such limit judged to be different from a computed tonnage or grade by more than 20 percent. That is, accuracy within which we can comfortably operate.

Chairman PROXMIRE. Mr. Shiskin, in your prepared statement you continuously stress the difficulty that your agency has in getting voluntary compliance from the industry in providing data.

You say in your prepared statement, "In addition, some companies were reluctant to report because they had reservations about the use of these data to compute average unit prices."

Further on down you say, "BLS options in this situation were limited because of the needs of the sponsoring agency, the attitude of the companies," and then you go on to say, "The BLS tried to reduce the reporting burden and to provide more time for companies to adjust their accounting systems," indicating that you tried to cooperate but it was difficult to get it from them.

Then you say, most alarming of all, "At the present time only about half of the companies selected for the probability sample of producers have agreed to furnish the national data required."

You are one of the most experienced men we ever had in Government in your position. You have worked with industry, all kinds of industry. How do you compare the cooperation of the petroleum industry with the rest of American industry; is it about average or not as good or better?

Mr. SHISKIN. Well, I really cannot answer that, Senator Proxmire.

Chairman PROXMIRE. The indications are from your prepared statement it is a whale of a lot worse, but I do not want to be unfair.

Mr. SHISKIN. Let me say my experience in the BLS is limited. However, I have had a great deal of experience at the Bureau of Census. I spent 24 years at the Bureau of the Census.

Now, my impression is that at the Bureau of the Census the reporting was much better than here in the oil industry. The Bureau of Census has both mandatory and voluntary reports. The mandatory reports are the censuses and the annual surveys; the voluntary reports are the monthly and quarterly surveys. My general impression is that reporting to the Census Bureau is far better than reporting to the BLS in this particular industry. However, if you would like to have an answer to your question about reporting prices to the BLS, the oil industry compared to others, I would like to have Mrs. Norwood answer that.

Chairman PROXMIRE. Mrs. Norwood.

Mrs. NORWOOD. I do not think that that is a very easy question to answer. We do in the wholesale price index have a great deal of cooperation from a large number of companies in many areas. We also have several areas in which we have had difficulty in developing cooperative arrangements. I think that we have been impressed with the difficulties in the petroleum area over the past several years as we have been trying to develop this.

Chairman PROXMIRE. Well, when you say impressed with difficulty, is there some technological reason for this, some technical reason, or simply they feel they just do not have to give the Government this information?

Mrs. NORWOOD. I think there have been a series of difficulties. One difficulty has involved the kind of data that has been required. We started off with an extremely ambitious program. We attempted to get not only data for the country as a whole but for several regions. We attempted not only to get data on price changes but for average prices as well and I think that the companies found that this was quite a burden in reporting.

Chairman PROXMIRE. Quite a burden in reporting? Will you give us some notion of this? The statement here is that about half, only about half of the companies selected for the probable sample, have agreed to furnish the data required. These are not little companies; this is not a Mom and Pop filling station operation; these are some of the biggest corporations in the world with enormous resources. So I would think that the burden of reporting the statistics which they have would not be very great.

Mrs. NORWOOD. I think the problem is that our sample has to cover both large and small companies.

Chairman PROXMIRE. What is that?

Mrs. NORWOOD. The sample has to cover the entire universe in our probability selection so we have both small and large companies. Some companies have better computerized facilities, better record-keeping than others. Some of them were more willing to cooperate and provide the data to the Bureau than others.

Mr. SHISKIN. May I add simply that the fact is that we have only half of the returns we need. The second fact is that most of these returns, nearly all of them, in fact, are coming in with a 2-month lag. Now, as Commissioner of Labor Statistics, and an experienced statistician, and I do not feel I can publish statistics with that kind of coverage and with that kind of timing.

Chairman PROXMIRE. That is a good response. Let me ask you. You indicated that this may be partly because some of the companies are not equipped to give you a response and they do not have the computers.

Now, do you find that large companies are cooperative and small companies are not cooperative, or does it not break down by size? You are shaking your head.

Mr. SHISKIN. I think you ought to allow the companies to answer that question.

Chairman PROXMIRE. You are the ones that are gathering the information.

Mr. SHISKIN. The fact is we have half of the returns we need. Most of them are coming in very late.

Chairman PROXMIRE. Now, it would seem to this Senator that the answer is to mandate by law that this response be required. Under the Census, much of which you handled under the Census this was required by law, is it not true?

Mr. SHISKIN. May I amplify that? I said a few minutes ago that at the Census Bureau they are all required by law. The monthly and quarterly surveys with very few exceptions——

Chairman PROXMIRE. I missed that.

Mr. SHISKIN. What I said, I want to clarify the facts before I respond to the question but I can assure you I will respond very fully. The facts are at the Bureau of the Census, the census and the annual surveys are required by law, but with very few exceptions, the monthly and quarterly surveys are not required by law. At the Bureau of Labor Statistics only one survey is required by law, that is the annual survey of occupational safety and health, all the monthly and quarterly surveys are voluntary. That is the fact.

Now, what should be done, first of all, I think that we should view mandatory reporting as a general statistical policy issue rather than as an issue concerned with the oil industry alone. Today we have problems with the oil industry, tomorrow it may be another area and 2 months from now it may be still another. So I think we have to view this in a general sense.

Also we have got to take a look at the household surveys. For example, we get our unemployment survey from our household survey. In the case of household surveys you have the issue of privacy. In the case of the business surveys you have the burden of reporting,

that is a major issue, and the issue of confidentiality. This is kind of background.

I would like to add one other point to the background. There is no uniform view among Federal statisticians, to the best of my knowledge.

Chairman PROXMIRE. You can certainly distinguish between households and corporations?

Mr. SHISKIN. Yes.

Chairman PROXMIRE. Privacy and so on.

Mr. SHISKIN. In some of the household surveys I consider reporting very essential, and I will come to my general proposition in a minute.

There is not a single view among Federal statisticians. I went to a meeting in one of our regional offices just last week at this very time and I asked them this question and most of them favored voluntary reporting of current surveys. Let me make it clear, however, I do not favor voluntary reporting.

Chairman PROXMIRE. You favor mandatory?

Mr. SHISKIN. I favor mandatory. I want to amplify that also. While I respect the great importance of privacy and I recognize the burden on respondents, I feel that certain surveys are indispensable to sound policymaking, and in these the public interest outweighs the disadvantages to individuals or private firms. Hence, provided that every effort is made to protect privacy and minimize the reporting burden, I would designate perhaps 10 monthly or quarterly surveys as crucial to policy and subject them to mandatory reporting.

Let me say I do not think it would be enough for Congress and any administration to designate the surveys as mandatory. They also should require the respondent to submit their reports within a specific time limit.

The reports we are getting from petroleum companies are coming in too late to be very useful. I think that is the other element which needs to be added.

Chairman PROXMIRE. How late are they coming?

Mr. SHISKIN. 95 percent of the reports that we have gotten today come with a 2-month timelag.

Chairman PROXMIRE. 2-month timelag or more?

Mrs. NORWOOD. Yes.

Mrs. STOTZ. Generally, 2 months.

Mr. SHISKIN. Let me summarize. I think I would recommend that both the administration and the Congress view this question of mandatory reporting as a general statistical policy issue not limited to the oil industry alone and that my personal recommendation is that we ought to designate about 10 or 12 surveys as essential to the public interest and make reporting mandatory.

Chairman PROXMIRE. As I understand, questionnaires were sent to some 200 firms but more than 90 percent of the action is in 15 to 20 firms. Who is holding out?

Mrs. SHISKIN. We do not reveal information about individual companies.

Chairman PROXMIRE. I am not asking you to tell me whether it is Exxon or Mobil, I am asking you who is holding out in terms of big

or small? You have some big and some small companies; is that right?

Mr. SHISKIN. It must be some bigs because we only have 50 percent of the returns.

Chairman PROXMIRE. Well, I think that certainly is an eloquent argument for mandating reporting by law. Originally the Bureau of Labor Statistics set a standard of 92 percent for publication, then reduced it to 70 and then 62 percent. Why not 50 percent?

Mr. SHISKIN. Why, I am not familiar with the figures you cite. I know that one letter was sent before my day at BLS, which used a number of 75 percent. If you have a probability sample, which we do have now, and you do not get complete reporting, the missing reports have to be distributed on a probability basis.

Now, if 50 percent of reporting would be adequate, if it were distributed properly, with a figure for the industry having a higher sampling error, so would 25. But we have picked a figure which would give us a report that would make the month-to-month changes in the index accurate so when you get much below that you do not have accurate enough information.

Let me also emphasize in an industry like the petroleum industry, which is dominated by a small number of big companies, it only takes one or two big companies to put you in the position that you cannot issue a report.

Chairman PROXMIRE. Well, it would seem that you should report what you have and indicate what the difficulties are and how it does represent a smaller sample that you would like and, therefore, it should be accepted with considerable care.

Mr. SHISKIN. Senator——

Chairman PROXMIRE. At least then the public is given some notion.

Mr. SHISKIN. Senator, I have written a great many articles on this subject and what I have learned on the basis of many studies is that very often when statistical agencies publish data of the kind you are describing, the statistical "noise" denotes—there is no real information in them. I am not about to issue that kind of data under my aegis as Commissioner of Labor Statistics.

Chairman PROXMIRE. If it is that bad it seems to me we simply have to mandate by law that you get this information. This lack of cooperation cannot be accepted. There has been so much serious talk about nationalizing the petroleum industry, at least putting it under public utility regulation. I oppose both of those. I think they would be serious mistakes, but I think the least we should do is require they give us the data so we know what the story is and make sensible Federal policies.

Mr. SHISKIN. I would agree if you also extend that to other industries who report to the BLS.

Chairman PROXMIRE. Well, it is not just a matter of the petroleum industry being in the public eye now, it is also a matter of there being, as you indicated, less cooperation from them than from the other industries.

Mr. SHISKIN. I would always add you have to start somewhere and this may be a good place to start.

[The following information was subsequently supplied for the record by Mr. Shiskin in the context of the above colloquy and interrogation by Chairman Proxmire:]

MANDATORY REPORTING

To begin with, I believe that mandatory reporting should be considered as a Federal statistical policy issue rather than as a requirement for the oil industry alone. Further, we should review all types of reporting, including household reports, where the principal issue is privacy, and business reports, where the issues are the burden of reporting and the confidentiality of individual company data. Finally, extensive hearings with data users, producers, and respondents should take place in advance of legislation.

At present the Censuses and many annual surveys are mandatory, but almost all monthly and quarterly surveys are voluntary. At the BLS, only the annual report on occupational safety and health is mandatory. All BLS monthly and quarterly surveys are voluntary.

Professional opinion is divided on the advisability of mandatory reporting. Some experienced survey statisticians believe that voluntary reporting tends to yield more comprehensive data, more promptly. In a recent visit to a BLS regional office, I discussed this question with a group of field representatives and, with only one exception, they all argued for voluntary reporting. On the other hand, the Census Bureau, which has had a great deal of experience with both mandatory and voluntary reporting, had made efforts in the past to obtain legislation providing for mandatory reporting of monthly and quarterly surveys. My own view is that mandatory reporting for essential monthly and quarterly surveys. My own view is that mandatory reporting for essential monthly and quarterly surveys is necessary. While I respect the great importance of privacy and recognizes the burden on respondents, I feel that certain surveys are indispensable to sound policymaking. Here the public interest outweighs the disadvantages to individuals or business firms. Hence, provided that every effort is made to protect privacy and minimizing the reporting burden, I would designate perhaps 10 monthly or quarterly surveys as crucial to policy and subject to mandatory reporting. Among these, I would include the principal BLS surveys of wholesale and consumer prices, wages, and employment and unemployment.

It would not be enough for Congress and the Administration to designate the surveys as mandatory. They should also require respondents to submit their reports within a specific time limit. Further, they should establish clear and tight laws which protect the confidentiality of individual reports.

As had been the tradition in the U.S. Federal statistical services, all the proposed questions in mandatory as well as voluntary reports should be thoroughly discussed with public groups and respondents before they are included on a report form.

Chairman PROXMIRE. I am pleased to learn of the improved BLS program for providing retail gas information. I only wish you could report similar progress with respect to the wholesale price index for petroleum. I have respect for BLS but I find it difficult to believe that an all-out effort has been made in this particular case.

How many people do you have working on the petroleum price index and do they work on it full time or part time?

Mr. SHISKIN. I asked that question last week. It is not an easy question to answer because the BLS is organized by functions. That is, we have people on a program plan, we have people on operations, we have people in the data processing center, and we have people in the field. So I could not get an answer on Friday, but I will get one very shortly.

[The following information was subsequently supplied for the record:]

During the month of January in order to improve the existing Wholesale Price Index for petroleum products the Bureau had 2 full time and 19 employees working part time on the project.

Chairman Proxmire. You mentioned inadequate funds. What effort has BLS made to get additional funds? Have you been turned down by the Congress or by the Office of Management and Budget?

Mr. Shiskin. Well, you know, very recently I was in the Office of Management and Budget and maybe I should speak to that is that OK?

Chairman Proxmire. In the Office of Management and Budget?

Mr. Shiskin. From that vantage point.

Chairman Proxmire. All right.

Mr. Shiskin. Because I am not there any more. When I came to the Office of Management and Budget in 1969, and first in conversations with Director Mayo and later with Director Shultz, it was clear that the major statistical surveys were developed at a time when they were not being used for the same kind of policy purposes that they are being used today, I believe it was in the 1970 budget there is a statement printed that says that a great overhaul in the Federal statistical system is required to bring the various surveys up to the needs of the day. Now, significant efforts have been made in the last 4 years to achieve that goal, but not all, we are not all the way there. I think that is particularly ture of some of our data on wages, on CPI, and on wholesale prices.

Chairman Proxmire. What is the money increase?

Mr. Shiskin. The money increase? Over what period?

Chairman Proxmire. Since 1969, for statistical programs.

Mr. Shiskin. All statistical? I may have that here. Yes, I do.

Chairman Proxmire. All BLS or all——

Mr. Shiskin. Let me cite a few figures. The total increase for statistics from 1966 to 1970 was 55.4 percent, and BLS got 21 percent. In the period 1970 to 1974 the total was 60.6 percent and BLS got 54 percent.

Now, let me amplify that a little further. Incidentally, this information appears in the article which I wrote when I was at OMB and it is published in the October 1973 issue of the "Statistical Reporter."

Now, however, I reduce these figures to constant prices and those figures show in the period from 1966 to 1970, whereas the funds for all statistics rose about 19 percent, the BLS fund decline, 7.4 percent. In the more recent period, 1970 to 1974, whereas constant dollars total rose by 20 percent, the BLS rose 24 percent. Thus the BLS budget in real dollars declined in the early period and rose less in the later period.

I would also add one final comment on that, and that is not only a question of fund but it is a question of authorized positions and there may be problems there too.

Chairman Proxmire. Problems with whom?

Mr. Shiskin. Well, it is a problem of getting the employment ceiling to do the work.

Chairman Proxmire. The ceiling is coming from the Congress or coming form this——

Mr. Shiskin. It comes from the administration.

Chairman PROXMIRE. OK. Now, Mr. Hodges, you have been aware of the efforts of the Bureau of Labor Statistics to improve the wholesale price index for petroleum products, and you have listened to my colloquy with Mr. Shiskin. Is it your own opinion that the data requested by the BLS would impose unreasonable reporting burdens on the oil companies? Do the oil companies have any reason to resist disclosure of this information, is there something they are afraid to have uncovered?

Mr. HODGES. I do not know what the position of the individual companies would be, Mr. Chairman. I understand that there are real reporting problems because of definitions. I suspect this is part of the delay, that it takes a long time for these figures to get sorted out and reported to BLS in the form in which it has been requested. If I could make a suggestion or recommendation, I think BLS and the companies will need to sit down and find out what is feasible.

Chairman PROXMIRE. Do they not recognize the urgency? In the last wholesale price report there was an enormous increase in the wholesale price of petroleum. I asked Howard Shuman, my administrative assistant, I was appalled by the increase, to check with the Bureau of Labor Statistics to find out where they got their information, and they said they got if from Platt's Oilgram. It was such a big increase. The impression may be exaggerated.

Mr. HODGES. Those are based on spot prices.

Chairman PROXMIRE. The public may get the notion the price increase is far greater than it is and we may have a policy action on the part of the Congress that is unfair. Why would it not be to your interest, the Petroleum Institute, to provide this information just as accurately and fully as possible?

Mr. HODGES. If I can separate myself from the industry, it is my personal opinion it is to their interest to cooperate with the BLS to get the best price data pertaining to the petroleum industry that can be provided.

Chairman PROXMIRE. We have this record attested to by one of the most respected men we have in Government that there has been poor cooperation from the industry. Why?

Mr. HODGES. Well, I think I have tried to indicate some of the whys and I think the companies themselves will have to answer as to what their individual problems are.

Chairman PROXMIRE. Other industries report on time and some of the people in the petroleum industry do report and half of them do not and some of the bigs do not. It is hard to understand how one could have a technical excuse that would not apply to the others.

Mr. HODGES. Well, what little I know about this, there are reasons and there are technical reasons. Different companies keep their books in different ways, they have different areas of setup and that sort of thing; but again, I cannot testify to the details of this, Mr. Chairman.

Chairman PROXMIRE. I would like to ask each of you gentlemen to comment on the problem that Senator Nelson spoke about so well this morning, about the great number of agencies that gather information, I think he said 64 in this field. What need do you see for designation of a single agency to serve as the agency to bring to-

gether and index existing energy-related information and gather such additional information as is required?

The Nelson bill would establish a new bureau within the Department of Commerce to accomplish this purpose, and would you comment on that idea? First, Mr. Rigg.

Mr. RIGG. Mr. Chairman, on Senator Nelson's bill, S. 2782, we have not established a position yet within the Department. I would say though, that one thing that I hope does not become paramount in the discussions on this is the accumulation of the data versus the capability of our commodity specialists to analyze the information and do something with it. Therefore, that is the key thing in everything we are talking about here. The figures that are compiled by somebody that does not understand them, whether it is in industry or Government, if there is no interpretation, we are in worse trouble than we are now. We have to have people that are capable of analyzing these figures and giving to the Congress and to the administration——

Chairman PROXMIRE. I agree with that because I understand what the bill would do is simply provide a library of information on which you would have three categories, public, confidential, and secret, and this would mean that there would be one place for those who want to use the information could go to get it, at least it would be gathered in one place where it could be secured by the public or by the Government agencies.

Mr. RIGG. I think that our data-gathering capability, and we have submitted to you copies of the forms we use, are just as good as anywhere in the Government, and I think that the Government information derived from them is meaningful. Whether we should set up a whole new bureau or not I do not know. I find that every time you set up a new bureau you have a timelag drop of 6 months or 1 year to get it started. Possibly it would be better to strengthen existing bureaus, both the Bureau of Labor Statistics and Geological Survey and Bureau of Mines.

Chairman PROXMIRE. No reason why it could not be put in the Department of the Interior, for that matter, in your office.

Mr. RIGG. That is right.

Chairman PROXMIRE. It is just a matter of finding a place to put it.

Mr. RIGG. That is right.

Mr. SHISKIN. Senator Proxmire, you may recall in earlier testimony we talked about the reorganization plan for Federal statistical agencies. Now, that plan was issued by Director George Shultz in the middle of 1971 and it called for the concentration of statistical activities, which are now spread all through the Government, in six or eight major statistical centers. Now, two of those centers were the Bureau of Labor Statistics and the Department of Commerce, Social and Economic Statistics in the Department of Commerce. When I was still at OMB, the reorganization had gone very well. All the statistical activities, or nearly all, all the important ones at any rate, in the Labor Department, are now in the BLS. Now since I left I have learned that similar moves have been made in HEW where consolidation is also badly needed. Now, the next step in this pro-

gram would be to take these very small agencies and fold them into the major centers.

Now, as part of this program, the program authority would all stay where it is. No one has intended to move the program authority. One of the principal reasons, without going on too long about this, is the technical know-how exists in the big centers. We have a very fine unit doay in BLS on probability sampling and the statistical methodology. We have a field organization that can collect data. The same is true of the Census. So that was the basic idea and I think was a good plan and we ought to stay with it. I have not read Senator Nelson's bill. I would have to read it before I can comment. But it generally seems like a move in the right direct since it would be moving the statistical work into the Department of Commerce where one of the big centers will exist and he would be leaving the price work in the BLS where the center for that exists. It seems that is a move in the right direction.

Mr. HODGES. I have not analyzed the bill. However, I understand the American Petroleum Institute will testify on February 5 or 6 before Senator Jackson.

Chairman PROXMIRE. I just have a couple more questions. I apologize for detaining you so long. This is such a vital area.

Mr. Rigg, one of the things that has concerned this committee very, very much is the failure of the Government to determine information about its own holdings.

Does the Government know as much as private corporations developing the Outer Continental Shelf in terms of information about resources and reserves, or would you agree with William Simon who told this committee last week, "That the Government did not know as much as private industry and that the Government's knowledge about its own offshore rights is very slight."

Mr. RIGG. I will agree with Mr. Simon on that. We do not even know how much land the United States owns. We still have not surveyed the whole United States and we cannot honestly tell you the total acreage of land in the public domain, onshore and offshore.

Chairman PROXMIRE. Well, I know there is quite a difference between that abysmal ignorance about these fabulously important and rich reserves that we have and that relate to the kind of policy we should follow.

For instance, what is the present approach and procedure used by the Interior Department in requiring, presenting, and assessing geological and geophysical data on the extent and quality of offshore resources and reserves in undeveloped areas such as the Atlantic coast, and in undeveloped provinces of producing regions and producing provinces? Could you give me a brief reply at this time and a more detailed written response to be submitted for the record?

Mr. RIGG. I will have Mr. McKelvey get a reply in detail.

[The following information was subsequently supplied for the record:]

RESPONSE OF HON. V. E. MCKELVEY, DIRECTOR, U.S. GEOLOGICAL SURVEY

Three phases of information development characterize the Government role in resource assessment on the OCS. Phase I involves broad areal studies to define favorable regions for exploration and to develop the basic data for ade-

quate resource evaluations. Most of the data for Phase I is gathered by various geophysical techniques—usually seismic or gravity. The Geological Survey either collects the data itself or contracts for its acquisitions depending on the area, timing, and quality of data required. Data gathered exclusively for the survey is open to the public; data gathered in concert with industry is restricted. Phase I studies also include the literature evaluation of available onshore and offshore geology as well as the evaluation of new geological data. The objective of thest studies is to determine the quality and quantity of potential oil bearing rock, its distribution, and its configuration in space. Whatever the source of the data, its evaluation or interpretation is performed by Survey scientists and, in the initial stage of the leasing process, is included in the prelimiinary geological resource evaluation prepared for BLM prior to the Call for Nominations.

Phase II involves a detailed study of the targeted basin for purposes of tract selection and further refinement of resource estimates. Geophysical data is still the primary information source in both developed and undeveloped provinces and is primarily acquired from industry sources by purchase agreement. The data are proprietary as are any interpretations therefrom; this means that the Government has access to the data for evaluation purposes but cannot publish the basis for their evaluation. In developed provinces well data is also extensively used. The evaluation and interpretations are carried out by Survey scientists and recommendations are made to BLM as to what tracts to offer for lease.

Phase III studies comprise detailed tract evaluation through potential reserve assessment and the identification and evaluation of economic factors. The data used are proprietary industry data acquired by purchase and through regulation. In Phase III all Survey data are used. The interpretations are made by Survey scientists and are directed toward determining a fair market value to guide BLM leasing decisions.

The present regulations and procedures used by the Geological Survey in acquiring, assessing and presenting geological and geophysical data on the extent and quality of offshore resources and reserves in both undeveloped areas and producing provinces for purposes of resource evaluation for public land management are as follows:

(1) Existing regulations require industry to supply data on OCS exploration and development. On core drilling programs in wildcat areas we require splits of the cores, copies of pertinent reports, and the supporting geophysical records. We also have had observers aboard the exploration vessels. Regulation do not require submittal of geophysical data acquired under non-exclusive permit, but proposed regulations requiring such submittals are presently being considered within the Department of Interior.

(2) All pertinent data from exploratory and development drilling done on Federal OCS leases are submitted to us in accordance with existing regulations. These data include preliminary seismic interpretations of prospective pay and hazardous zones prior to drilling, well engineering, platform data, downhole electrical logs and all other survyes, monthly production data, well test data, paleontologic data and/or a split of the well cuttings, if necessary, and complete geological and engineering studies of each field necessary to support Maximum Efficient Recovery determinations, commingling, and unitization. In short, we have access to all pertinent data from lease operations, and have many times more data than any individual operator. This information is supplemented by material which we have internally generated since Federal jurisdiction over the mineral resources of the Federal OCS was established.

(3) To supplement these data modern sophisticated geophysical data covering the areas to be evaluated are acquired. Because normal surface geologic mapping is impossible on submerged lands and the absence of well control in undeveloped areas prevents adequate subsurface geologic mapping, geophysical data are the primary sources of information for the evaluation of these areas. These data do not prove the presense of oil and gas but are necessary to define the sedimentary section and locate geologic structures favorable for the occurrence of oil or gas in commercial quantitites. Since 1969, when budgetary support for acquisition of geophysical data was obtained for resource evaluation programs, the Geological Survey has purchased necessary data from seismic service companies. A determination is made of the amount and pro-

posed location of the data as well as the technical specifications required, and these and other technical parameters are given to contract specialists within Geological Survey to advertise the Government's intent to acquire the data and to conduct the necessary contractual procedures in acquiring it. This assures that all companies with the capability to provide the data needed have an opportunity to contract their services. When the data are received in the specified format, they are reviewed by Geological Survey geophysicists for conformance with technical specifications.

Using these acquisition procedures, we control the type and quality of data used and obtain the data at the lowest possible cost. For lease sale tract selection purposes Survey geophysicists make a preliminary interpretation of the data and prepare a travel time-structure-contour map to determine the most prospective structures. These data and maps are used, at this stage, for both environmental impact assessments and statements. Following the final tract selections, which are the "localized" areas to be evaluated for potential resources, detailed geophysical interpretations and maps are prepared.

(4) Using the detailed geophysical maps and reports, geologists redraw the maps on depth (instead of travel time) and, with the aid of stratigraphers and paleontologists, prepare maps showing reservoir thicknesses. This requires knowledge of all related geology from trends, stratigraphy, and Paleontology.

(5) Petroleum engineers use the maps and accompanying data to determine the acre-feet of potential hydrocarbon bearing reservoir. Many factors concerning reservoir mechanisms, and characteristics are determined from the nearest exploratory and producing wells and comparable producing fields. Hydrocarbon recovery factors are estimated from these data and potential resources are estimated. These estimates are, for the purpose of lease sales, considered to be "estimated recoverable reserves" and treated accordingly to determine pre-sale values. Using many factors such as exploratory well costs, operating costs, price of products, rate of return on invested capital, etc., the present worth value of each tract is determined by a discounted cash flow calculation. A risk or probability of success factor is applied and the resulting figure is adjusted for dry hole costs.

(6) For the December 1972, and later OCS sales, Geological Survey has used an additional technique to obtain an estimation of tract value, which serves as a check on the previously determined pre-sale value. This new technique is called the Range of Values method and has commercial, industrial, and scientific applications where there is great uncertainty. The final outcome or result of a series of interrelated factors, or events each of which is unknown or uncertain, is predicted by a random selection of values for each parameter, based on the laws of probability.

The Range of Values computer program developed by USGS determines a value of each OCS tract by the discounted cash flow method, but instead of considering just the *most* reasonable estimate of each significant parameter, the program considers *all* reasonable estimates. As an example, USGAS scientists may agree that the *most* reasonable estimate of the thickness of an oil-bearing sand is 100 feet. They may also agree that the sand may very well be only 20 feet thick, but that it might be as much as 200 feet thick. The computer program selects one number between 20 and 200. Other critical parameters such as permeability of the sand, cost of drilling, etc., are handled in a similar manner, and a value is computed for the tract. For each tract the process is repeated 500 times and 500 different values are obtained. Thus, for each tract a range of values is obtained. The mean or average of the 500 values is what statisticians call the "expected" value, which is an estimate of the resource value.

Data obtained from our resource evaluation programs are presented to the Bureau of Land Management for use in (1) preparing lease sale schedules, (2) environmental analyses, (3) tract selections for sales and (4) evaluation of bid acceptance or rejection. Evaluation data are also used in programs involving management and supervision of operations on leased OCS lands.

The Survey has compiled the most complete well log file of the outer continental shelf in existence with more than 25,000 logs of the more than 9,500 producible oil and gas completions and 5,000 nonproducing holes, with their corresponding tests reports, completion reports, production records, directional surveys, etc. Other data include: almost 2,000 detailed paleontology reports, several hundred paleontologic summaries, and paleobathymetric maps covering

all determinable paleoecological zones based on correlations, biostratigraphic markers, and assemblages indicateing a plane or time line, more than 140,000 line miles of CDP seismic coverage and thousands of line miles of sea gravity, magnetics, sparker and high resolution geophysics, computerized sand/shale ratio studies, computerized reservoir studies, etc.

The total budget for our OCS resource evaluation program was about 7.0 million dollars in fiscal year 1974. This supported a staff of about 100 people, a 2.5 million dollar geophysical data acquisition program and computer programming time. Offices involved in resource evaluation functions on OCS lands are located in Metairie, Louisiana; Washington, D. C.; Menlo Park and Los Angeles, California; Wood Hole, Massachusetts; Corpus Christi, Texas; and Anchorage, Alaska. These offices are staffed with geologists, geophysicists, paleontologists and engineers. Ancillary computer expertise is provided through our System Analysis and Development Section in Denver, Colorado. Administration of the program and economic analysis is provided through our National Center headquarters in Reston, Virginia.

Mr. RIGG. I would like to have him address himself to this situation because he is probably the Nation's greatest expert on this problem.

Mr. MCKELVEY. Senator, if I understand the question, you are asking about reserves in producing regions and also in yet unexplored regions.

With respect to producing regions, we do not require presently the companies to furnish information on reserves and we do not have the capacity to calculate accurately proved reserves ourselves. We are beginning to develop that capacity on the Outer Continental Shelf.

Chairman PROXMIRE. Is it not appalling we do not have the capability of determining what we have, in view of the great importance of these resources?

Mr. MCKELVEY. Yes, sir, I fully agree with that. I have been concerned about it myself for some time. It is not a matter of the capability, we have the competence in the sense of competence, but we simply do not have the capacity and funds and manpower.

Chairman PROXMIRE. Have the funds been requested?

Mr. MCKELVEY. Well——

Chairman PROXMIRE. At any level?

Mr. MCKELVEY. We have been requesting authorization for expansion in both the area of the Outer Continental Shelf management and assessment, and generally the increase that we have come to Congress with in the last several years have been substantial in both these areas and have been fully funded.

Chairman PROXMIRE. They have been fully funded but apparently the requests have not been adequate, is that right?

Mr. MCKELVEY. Have not been adequate to develop the capacity I am referring to for the estimation of crude reserves.

Now, with respect to unexplored regions. Of course, no one can see in the ground and no one knows for certain until there is drilling whether or not oil is present.

We have attempted ourselves to estimate what I might call potential reserves, how much oil could exist, even though it has not yet been discovered.

We do this on the basis of various procedures; for example, estimating the volume of sediment that might be present in a given

area, and then by analogy with areas in which exploration has been undertaken, how much oil might be present in that volume of sediment.

These estimates are really very crude and we are attempting to improve the methods by which they can be made. We do attempt such estimates for unexplored regions.

Chairman PROXMIRE. Maybe you can enlighten us on what effect the increase in the per barrel price of crude oil from $2.25 to $5.25 has on reserves? I am not asking for any kind of a rough estimate, I am just asking for what kind of increase would be within the ballpark—100 percent, 50 percent?

Mr. MCKELVEY. I would doubt very much that it would be 100 percent, but——

Chairman PROXMIRE. It would be less than 100 percent?

Mr. MCKELVEY. I would think so.

This is with respect to crude oil. But the point is a very significant one and I might, to give some perspective, say that presently on the average we recover only about 31 percent or some of the oil that is actually in place in the reservoir. That means over history, I believe——

Chairman PROXMIRE. And you recover only 31 percent because at the price we had up until the beginning of last year, that was all that was economically feasible. Obviously if the price had been higher, we would have recovered more; is that right?

Mr. MCKELVEY. It is both price and technology.

Chairman PROXMIRE. I understand. Technology is something that has increased enormously but has not technology been increasing in the last few months as price has? You said less than 100 percent; would you say more than 50 percent?

Mr. MCKELVEY. No—let me go through some arithmetic. I think that the total of past production and present proved reserves—perhaps the API representative can check my memory on this—is about 140 billion barrels.

Now, if two-thirds of the oil that is actually present in the reservoirs is till in the ground, that means that still in place and not previously recoverable would be about 180 billion barrels. Suppose that through a combination of price and the technological improvement that price incentive might have, suppose we were able to just increase that, just increase our recovery by 1 percent, that would be 2.8 billion barrels. If we are able to do it by 10 percent, that would be 28 billion barrels. Twenty-eight billion barrels certainly would be more than 50 percent of present proved reserves.

I can only speculate—I am not a petroleum engineer, and this is not in my area—I could only speculate as to what the effect of price would be actually in increasing the availability through secondary and tertiary recovery acceleration, but I am rather confident that it would. It would take some time for any significant increase to come from this direction, certainly a period of several months, and it might be a period of several years. But if prices were to go to the levels that——

Chairman PROXMIRE. $7?

Mr. McKelvey. $7, $10, something like that, I would think there would be a significant effect in this area.

I might point out also if prices went to $7 or $10 a barrel it would seem to me at least, and again this is not my area of competence, but it would seem to me there would be little question that that would make available oil from shale on an economic basis, not in the form of crude oil, but in the form of hydrocarbons that can be made into petroleum products. Here we are looking at a tremendous potential.

Chairman Proxmire. Well, thank you very much.

This is most helpful.

I would like to ask Mr. Rigg when and under what conditions are private companies required to submit exploratory production data to the Government regarding underdevelopment regions.

Mr. Rigg. They are not required to give us this information. We buy a lot of information from geophysical service organizations.

Chairman Proxmire. So they are not required to submit that kind of data to the Government?

Mr. Rigg. No, sir.

Chairman Proxmire. Is it correct the Interior Department has under consideration a system which would require private companies and individuals conducting geophysical and geological exploration in the Outer Continental Shelf to submit all raw data to the Government as a condition for obtaining exploration permits?

Mr. Rigg. Yes, that is right.

Chairman Proxmire. You do not know what disposition the Government will make of that recommendation, however?

Mr. Rigg. That is right, it is still under discussion.

Chairman Proxmire. Is it true that such proposals have been considered by the Government for several years and that you, Mr. Rigg, have personally opposed this idea?

Mr. Rigg. Not that I know of.

Chairman Proxmire. You have no objection to it?

Mr. Rigg. Well, I just want to know what the information is we are going to get and I want to know what utilization it is going to be made to. I believe your problem there, Mr. Chairman, is whether you are going to want to make this information open to the public.

Chairman Proxmire. Why not make it open to the public; the public owns it.

Mr. Rigg. Then who will do the work?

Chairman Proxmire. The public is part of the two contractors, the public owns the land on the Outer Continental Shelf; it is negotiating with the companies; the companies know, get the information; why should the lessor of the land not know what he is leasing, what he is getting for it?

Mr. Rigg. Who will do the work out there if they have to make it public? The private sector does it.

Chairman Proxmire. Why shouldn't the private sector do it if they can make money?

Mr. Rigg. They will wait for the next fellow to do it. I would not go out there and do any informational activity as a private person if I knew someone else was going to do it and it would have to be

made available to anyone that wants it. I think that a lot of this activity would come to a complete stop.

Chairman PROXMIRE. Wait a minute, there is no reason why the Government should not have it in the first instance and I would agree maybe it is a matter of time before it is made available to the public. But why shouldn't the Government have it? And at the present time the Government does not have that information.

Mr. RIGG. We have all the information available to us on land that we have leased out. On lands that are not leased on the Outer Continental Shelf——

Chairman PROXMIRE. You only give the information after you lease it; you don't give it before you lease it; is that right?

Mr. RIGG. That is on leased areas; that is right.

Chairman PROXMIRE. Why shouldn't you have an advance so you know what you are leasing, so you know whether you are making good bargains. What do you have?

Mr. RIGG. We have a lot of information. I will ask Mr. McKelvey to give you some figures.

Chairman PROXMIRE. You just told us they are not required to provide the information to the Government before the lease.

Mr. MCKELVEY. Mr. Chairman——

Chairman PROXMIRE. If the Government wants it they have to buy it.

Mr. MCKELVEY. We buy the geophysical data under present regulations. As you pointed out earlier, under consideration in the Department is a change that would require mandatory submittal.

Chairman PROXMIRE. Do you favor that?

Mr. MCKELVEY. Yes, I do.

Chairman PROXMIRE. Has the Interior Department ever conducted a study of the cost incurred in dollars, manpower, and time for a Government exploratory system sufficient to bring the Government's understanding of resources and reserves in the Outer Continental Shelf at least up to the level of private industry? If such a study has not been performed, I would like to request one be done by your Department and would like to have it submitted to this committee within 2 weeks.

Mr. RIGG. Yes, sir.

Chairman PROXMIRE. Can you do that?

Mr. MCKELVEY. Let's go back and take a look at what we have.

Chairman PROXMIRE. All right, fine, do that and then tell us what would have to go into such a study.

Mr. MCKELVEY. Yes.

Chairman PROXMIRE. All right, sir.

[The following information was subsequently supplied for the record:]

RESPONSE OF HON. V. E. MCKELVEY, DIRECTOR, U.S. GEOLOGICAL SURVEY

Prior to lease, industry collects geophysical data on OCS lands under permits. Industry is presently not required to submit these data to the Federal Government as a condition of issuance of the permit. Under consideration in the Department of Interior is a change that would require mandatory submit-

tal of pre-lease geophysical data. An alternative to acquisition of geophysical data from industry, either through purchase, or mandatory submittal of data, would be to provide for a Government exploratory system that would independently acquire and process geophysical data to the extent necessary to bring the Government to a position equivalent to that of industry. Studies have been made with regard to the feasibility of acquiring geophysical data through use of various alternatives in the past.

In 1968, the U. S. Geological Survey initiated a program of geophysical data acquisition to effectively support resource evaluation functions on unleased acreage of the Outer Continental Shelf (OSC). At that time it was necessary to make a determination as to how the geophysical data needed could most efficiently be acquired. We concluded that an in-house system of utilizing geophysical survey ships; common depth point (CDP) seismic data collection, computer processing, etc., would lag behind industry in overall quality because of staffing and funding problems. In addition, it was considered too early to attempt to obtain the grid control needed for detailed geophysical interpretations required for resource evaluation in conjunction with research surveys. We ascertained at that time that the resource evaluation mission would be expedited by acquiring the best process geophysical data available through contract. When a legal opinion allowed that the Government could participate in group seismic surveys as a late participant, data became available at costs 1/20th of those normally required to conduct a survey on an exclusive basis.

An alternative to acquiring data from geophysical contracting companies is to establish an independent government exploration system. The cost of establishing such a system would require massive increases in both funding and manpower. A recent preliminary analysis prepared by industry representatives of the cost of geophysical surveys and their complete interpretation and publishing on an average five by five mile grid covering the entire OCS and supplemented by one hundred deep stratigraphic tests show such a program would cost on the order of two billion dollars. They assumed a complete and highest quality program.

In the past several months the Survey has compiled its own estimates of the necessary monies, manpower, and time to evaluate the entire OCS. It is not possible to say whether or not these proposed funding levels and efforts would give Government "an understanding of resources and reserves in the OCS at least up to the level of private industry" because industry is in no sense monolithic in its OCS understanding. The estimates were made, however, with a mind to developing the necessary non-proprietary data to 1) permit an orderly development of the OCS, 2) determine a fair market value for potential leases, and 3) proved data necessary for adequate environmental assessment. The attached table itemizes our initial estimation of costs fo an adequate Government evaluation of the OCS. These estimates were prepared without benefit of detailed cost studies. Such a detailed cost appraisal and assessment of necessary additional for the entire OCS is underway and will be completed by March 15. The recommended expenditure level would give government a thorough understanding of the OCS and permit it to more effectively perform its functions in evaluation, tract selection, and lease management.

TABLE I.—COST ESTIMATES FOR OCS RESOURCE EVALUATION

[Dollar amounts in thousands]

	1975	1976	1977	1978	1979
Phase I (area selection)	$43,000	$47,200	$40,200	$40,200	$33,200
Personnel	125	125	125	125	125
Phase II (tract selection)	$58,169	$59,200	$59,200	$59,200	$59,200
Personnel	173	215	215	215	215
Phase III (tract evaluation)	$7,728	$9,400	$9,400	$9,400	$9,400
Personnel	167	245	245	245	245
Total	$111,897	$115,800	$108,800	$108,800	$101,800
Total personnel	465	585	585	585	585

Five-year breakdown of major expenditures

Phase I:[1]	
Exclusive seismic reflection (200,000 mi at $350 per mile)	$70,000
Exclusive seismic refraction (50 traverses at $200,000 each)	10,000
Exclusive aeromagnetics and gravity (4.4,000 mi at $12 per mile)	5,000
Stratigraphic tests (about 20)	100,000
Environmental studies	16,800
Total	186,800
Phase II:[2]	
Exclusive seismic reflection (150,000 mi at $500 per mile)	75,000
Stratigraphic tests (about 20)	100,000
Environmental studies	50,000
Industry seismic reflection contracts (500,000 mi at $30 per mile)	15,000
Phase III: Industry seismic reflection contracts (500,000 mi at $30 per mile)	15,000

[1] Includes OCS evaluation out to 4,500 mi water depth 20–50 mi spacing of data.
[2] Includes OCS evaluation only on shelf and upper slope 4–5 mi spacing of data.

NOTE.—All data purchased or generated will be used for all 3 phases of the program. The total seismic data bank will include more than 140,000 line mile sof reflection data already purchased. The effect of mandatory submitted of geophysical data acquired under geophysical exploration permits has not been fully assessed. Significant variables in expenditures are possible depending on final decision as to necessary level of Government understanding.

Chairman PROXMIRE. In all these areas I would advise you to strike while the iron is hot. It is never hotter than it is now and it may cool off considerably in the next year or two. Now is the time to move in and get the kind of information that will provide for an informed public and a far better equipped negotiating government.

To what extent does the Interior Department have exploratory data on publicly owned coal sufficient to judge the amount of resources and reserves in place; the quality of the reserves, including sulfur content, ash content, and Btu value, and whether there is sufficient quantity of public-owned coal to warrant subjecting them to competitive leasing?

Mr. RIGG. On the first one, we released in 1971 an information circular 8531 from the Bureau of Mines, on stripable reserves of coal in the United States and that contains stripable reserves data by State, county, seam, and sulfur content. In early 1974 we will release another which is availability of bituminous and subbituminous coal and anthracite for underground mining in the United States. Both of these are the most up-to-date and informative data we have. But, Senator, I would say that when you ask whether the data is accurate or not, it would depend on who wants to use it, whether these tons of coal and quality and content of the coal are identified accurately enough for specific mining operations in specific areas is a matter of conjecture.

Chairman PROXMIRE. Let me ask you this: Is it correct that much of the Government coal and mineral rights are presently leased on a noncompetitive basis, and isn't it also true that prospecting groups often sell the rights they obtain from the Government on a noncompetitive basis to brokers who often sit on the holdings for speculative purposes?

Mr. RIGG. That is what happened in the past.

In December 1972, the Secretary canceled all unacted upon prospecting permits and announced at that time that leasing would be

done on a competive basis for coal, based also on the need to keep current operations going, to close environmental scrutiny of what was going on in the area, and the need regionally and nationally for the coal in the area, but the only sale we have had since then has been on a competitive basis.

Chairman PROXMIRE. Well, then, perhaps I know the answer to the next question. Let me ask it anyway. Is it true there are more coal reserves presently under lease than are or can be developed under present projections, that most of the deposits simply are being sat on for private speculative purposes and are not being developed, and that if we continue to sell coal under Federal land we will be just putting more in the hands of the private speculators?

Mr. RIGG. I don't think so. Our figures indicate to a great degree that we have insufficient coal leased to meet the demands that coal will have to have in the next 10 or 15 years.

Chairman PROXMIRE. The question is, How much coal that is being sold from government land is being developed now? Do you have figures on that?

Mr. RIGG. We have annual figures on the amount.

Chairman PROXMIRE. What do they show?

Mr. RIGG. Coal is being produced off the Federal lands. I thought I had a——

Chairman PROXMIRE. I am talking about the percentage of land, not the amount, the percent.

Mr. RIGG. The percentage of land?

Chairman PROXMIRE. The percentage of the land that has been sold that is actually under development, and the percent that is held for speculative purposes.

Mr. RIGG. I cannot break it down whether it is being held for speculative purposes or whether it is being held for coal gasification plants or committed to powerplants already, but not in production can I give the figures. The total amount under lease acreage, which is also the amount of the land that is under production——

Chairman PROXMIRE. Would you deny that about 10 percent of the present coal leases are being produced currently and the rest, 90 percent, are held for speculation?

Mr. RIGG. I would.

Chairman PROXMIRE. Well, how would you correct that then?

Mr. RIGG. Well, I would because of the figures of the coal that I know is dedicated. I had a report made up.

Chairman PROXMIRE. Can I ask Mr. McKelvey to comment?

Mr. MCKELVEY. I believe, sir, the percentage is large. I do not know what it——

Chairman PROXMIRE. Which percentage is large?

Mr. MCKELVEY. Not being developed. But I do not have it on the tip of my tongue.

Chairman PROXMIRE. Give us those figures for the record.

[The following information was subsequently supplied for the record:]

As of June 30, 1973, there were 630 coal leases on Federal lands involving 778,440 acres. During FY 73, coal was produced from 54 leaseholds embracing 68,400 acres. Thus the percentage of coal leases currently in production is about 10%. However, coal has been produced in the past from 176, or 33% of the 530 existing leases.

FEDERAL COAL LEASEHOLDS WITH CURRENT OR PAST PRODUCTION, BY YEAR OF ISSUANCE AND STATE

	Number of leases issued and still in effect	Number of leases having production	Percent of leases with production
Year issued:			
1920–29	24	24	100
1930–39	28	26	93
1940–49	39	38	97
1950–59	86	41	48
1960–64	125	29	23
1965–71	228	18	8
Total	530	176	33
State:			
Alabama	1	1	100
Alaska	4	4	100
California	1		
Colorado	112	40	36
Montana	17	6	35
North Dakota	20	11	55
New Mexico	30	14	47
Ohio	1	1	100
Oklahoma	53	24	45
Oregon	3	1	33
Washington	2	1	50
Wyoming	91	20	22
Utah	195	53	27
Total	530	176	33

Note: Cumulative coal production, value and royalty, 1920–73: Production—293,500,000 tons; value—$1,160,000,000; royalty—$35,500,000.

Mr. RIGG. Mr. Chairman, the USGS estimates the fiscal year 1973 production of coal from Federal lands will total about 14.0 million tons, and they project within the next decade a total annual production of 105 million tons of Federal land coal, of which 84 million tons or 80 percent will be produced from surface mines.

Chairman PROXMIRE. That comes to 20 percent of national production.

Mr. RIGG. Fourteen million tons is about 2 percent, while 105 million tons is about 20 percent of the current national production.

Chairman PROXMIRE. I am informed that a massive new coal leasing program is being developed by the Interior Department under great pressure from private industry and Federal energy officials and a decision is scheduled for June.

First, I want to know if it is true, and if true, can you explain to me why we need a massive new program to sell coal on public held land inasmuch as 90 percent of the coal rights that have been sold are being sat on for speculative purposes?

Mr. RIGG. Well, of course, I do not say they are being sat on for speculative purposes.

Chairman PROXMIRE. Are being sat on for some purpose, not being developed now or just being held out of production.

Mr. RIGG. Well, now, we project an annual production on the contracts we know about of 105 million tons, that is already under contract. We also know that there is over a billion tons of coal that is dedicated for gasification.

Chairman PROXMIRE. As I understand it, under the present program there is no requirement that the company buying the coal has to produce the coal at all.

Mr. RIGG. That was under past policy contracts. Under present contracts that no longer applies.

Chairman PROXMIRE. Under the early ones you can still hold it out, nothing has been done about that?

Mr. RIGG. You cannot make it retroactive on a contract.

Chairman PROXMIRE. Would there be any capability of canceling those rights if they have not developed them?

Mr. RIGG. They only have to pay their annual rental fees to keep the leases valid.

Chairman PROXMIRE. Is there a massive new coal leasing program being developed by the Interior Department?

Mr. RIGG. We are looking at a new coal leasing program down there but I do not know whether the term "massive" is indicative.

Chairman PROXMIRE. Is that program being pushed by the industry?

Mr. RIGG. It is being pushed by Interior more than anybody else.

Chairman PROXMIRE. Private industry is interested, too.

Mr. RIGG. Certainly private industry is interested.

One of the best ways to get the fuel costs down is to get more available and let competition get in there.

Chairman PROXMIRE. There will be a requirement when you lease this land a certain amount of it must be produced or developed?

Mr. RIGG. There will be some production requirements similar to what we put in the oil shale lease forms.

Chairman PROXMIRE. Has the Government ever done a study of cost in terms of dollars, manpower, and time that would be required for the Government to run an exploratory system sufficient to bring the Government's understanding of coal resource and reserves in the public domain at least up to that of the private industry capability?

Mr. RIGG. Well, I kind of think we know as much as private industry does on the public land in coal.

Chairman PROXMIRE. Is that your impression, Mr. McKelvey?

Mr. MCKELVEY. We are doing a certain amount of drilling, Senator, on coal lands in connection with coal land classification.

Chairman PROXMIRE. My question was, do you think that the Federal Government has a capability and understanding of coal resources and reserves in the public domain equivalent to that of private industry?

Mr. MCKELVEY. I rather think we do on the public domain, sir, because we require the companies under lease to turn over their information acquired in the course of drilling and this, of course, is the principal source of that information.

Now again we do not have the capacity to analyze and make full use of that information.

Chairman PROXMIRE. That is critical. Private industry has that capacity, of course.

Mr. MCKELVEY. Yes, each company would have capacity for——

Chairman PROXMIRE. So No. 1, we do not know until we sell it what it is worth, and they know because they have done the exploration, and No. 2, they have the capability of developing and interpreting and analyzing and using the data which we do not have.

Mr. McKELVEY. I will ask Mr. Rioux to speak up if I am incorrect on this, but I believe that information that is acquired under a prospecting permit must be turned over to us so that we have that information but as I say, we may not be able to make the maximum use of it.

Chairman PROXMIRE. Why do you do that on coal and not on oil?

Mr. McKELVEY. We do it on oil.

Chairman PROXMIRE. Offshore?

Mr. McKELVEY. Offshore.

Chairman PROXMIRE. I thought you just told us you did not require it.

Mr. McKELVEY. No; that was with respect to the geophysical information on unleased areas. It is a difference in the regulations that exists but the nature of the regulation is that offshore a prospecting permit can be issued which is nonexclusive in nature. Prospecting and surveys by geophysical means can be undertaken on land that has already been leased or land that is not leased.

Chairman PROXMIRE. All right, then, for the record, would you submit, Mr. McKelvey and Mr. Rigg, within a couple of weeks, an indication of what would be required to give the Government the capability of using this data, of interpreting this data, and analyzing the data, and of acquiring the data.

I understand you do say the data is now submitted to you with respect to the Government's domain; but I also understood you to say we do not have the capability to analyze it.

Mr. McKELVEY. Fully utilize it, that is correct.

Chairman PROXMIRE. Will you give us a notion of what this will take?

Mr. McKELVEY. Yes, sir.

[The following information was subsequently supplied for the record:]

RESPONSE OF HON. V. E. McKELVEY, DIRECTOR, U.S. GEOLOGICAL SURVEY

We have already dealt with the Geological Survey's sources of data and capabilities for evaluating for oil and gas. This discussion will be restricted to coal.

The Federal Government has a basic capability equivalent to private industry for determining the extent of coal resources and reserves in the public domain inasmuch as both permittees and lessees must submit the coal data generated by exploration and development programs under existing regulations. Each company will, of course, have full analyzed the results of their individual exploration and development programs and thus be more knowledgeable on their specific leaseholds. Only the Federal Government through the Geological Survey, however, has access to the basic geologic and engineering data of all companies operating on the public domain. This includes data from not only coal operations, but also coal related material from operations of oil and gas and other leasable minerals on public coal lands.

We are able under current regulations to acquire basic geologic and engineering data from permittees and lessees operating on Federal coal lands. This includes data from core drilling, churn drill or measured section on depth to the coal or coal beds, thickness, detail of beds including splits, or bone, heating value, sulphur content, moisture, and volatiles. This type of information provides the basic material for determining reserves. We also receive certain interpretations of the basic data in form of maps showing the structural configuration of the coal along with the variations in its thickness. We require access to additional data if needed but do not make a practice of requiring

core samples. Warehouse facilities would be necessary if core splits were to be acquired systematically and stored for all core holes drilled on Federal lands. Increases in both funds and personnel as well as storage facilities would be necessary to maintain these data. A system of requesting core splits for examination, analysis, and return would be preferable. We do not presently require companies to furnish interpretive information such as reserves except in support of specific calculate reserves for all leased minerals on Federal lands. However, we do calculate coal reserves on individual tracts in advance to issuing a lease to determine advance royalty payments.

The data submitted by coal permittees and lessees in itself is inadequate for a total evaluation of the coal on public lands. A major part of the Federal coal land is not under coal lease or permit so no information is available from operators. Most coal prospecting permit areas have not been sufficiently explored to determine reserves. Coal operators generally define those areas and beds which are necessary for their own proposed operation. This often does not include all coal seams in a lease. Additional information is needed to cover those areas that are beyond the immediate interest of the coal companies.

In recent years the information submitted by coal permittees and lessees has been supplemented by material gained in operations on Federal oil and gas and other non coal leases. The data varies with the type of operation. Most of our coal provinces are valuable for oil and gas. Subsurface surveys of the well bore, especially using gamma ray logs have provided us with valuable information on depth and thickness of coal beds, especially in the powder River and San Juan basins.

The information I have just outlined is, in itself, inadequate to determine the coal reserves and resources on Federal lands. In order to fill in the gaps in our knowledge, especially on unleased land, we conduct coring programs, sample outcrops and cuts, and conduct field mapping. At present we have a contract with the State of Montana to conduct coring in that state. Field mapping is being conducted in most of the major western coal areas including Alaska. The proposed budget for Fiscal Year 1975 includes an increase in both staffing and funding to expand the core drilling and other information gathering capacity specifically for evaluating our Known Coal Leasing Areas on a tract by tract basis.

The Secretary's coal program calls for numerous lease sales of coal on Federal lands. To meet this schedule we need Survey generated echnical information for use in definition of Known Coal Leasing Areas and in the tract selection—tract evaluation process.

In order to provide resource and reserve data on all Federal coal land will require even greater increases in funding and manpower. Our present staff involved in coal resource classification and evaluation and lease management programs on Federal lands could not handle this additional workload. Our capability is to be expanded in FY 1975 to meet a part of these needs, but additional funding and manpower would be required to meet the full workload.

The President proposed on January 23, 1974, to submit legislation shortly, requiring energy producers to provide to the Government a full and constant accounting of their inventories, their production and their reserves. If such legislation were to be enacted and coal reserve information on Federal lands were received separately, it would be possible to independently verify reserve data within a reasonable degree of accuracy through us of a random sampling and verification process utilizing the basic data acquired by Government on Federal lands. This spot check technique could operate similar to procedures employed by the Internal Revenue Service in auditing tax returns with the exception that one would not expect the degree of precision applied to financial data to hold true for the more subjective judgment as to unseen reserves of coal in the ground.

In summary, the U. S. Geological Survey, as a scientific fact-finding agency, can, and does, utilize industry-derived coal data, supplemented with its own data generating capacities, to provide basic coal information with regard to the public lands for use in public decision-making. To fully utilize these data in terms of our current energy emergency will require substantially greater capacity to provide even greater effort in the future.

Chairman PROXMIRE. Gentlemen, I want to thank you very much for your most helpful testimony. I know we have documented in

spades the fact we have a whale of a lot of work to do before we have the kind of information we should have about our energy resources, production costs, and prices.

The subcommittee stands adjourned.

[Whereupon, at 12:50 p.m., the subcommittee adjourned, subject to call of the Chair.]

○