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STATEMENT OF

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BEFORE THE

SUBCOMMITTEE ON  
ENERGY RESEARCH, DEVELOPMENT, AND DEMONSTRATION

COMMITTEE ON SCIENCE AND TECHNOLOGY

U.S. HOUSE OF REPRESENTATIVES

FEBRUARY 11, 1976



The Federal Energy Administration (FEA) under Public Law 93-275 is required to "assess the adequacy of energy resources to meet demands in the immediate and longer range future for all sectors of the economy, and for the general public" and to "develop plans and programs for dealing with energy shortages." It is under this mandate that FEA requested funding for the Fossil Fuel Activity for FY '77. Within the Energy Resource Development Division of FEA, we have an Office of Oil and Gas and an Office of Coal to provide technical advice and analysis associated with a wide range of fossil fuel issues.

#### Natural Gas

Declining natural gas supplies have introduced new factors into the operation and management of the gas industry, such as idle pipeline capacity, changes in utilization and consumption of natural gas, allocation of supplies to satisfy market demands and the introduction of supplementary fuels such as Liquefied Natural Gas and Synthetic Natural Gas. Deregulation of new natural gas production is part of this effort. FEA is involved in development of constructive and responsible Government actions in order to adapt to the present natural gas situation.

#### Natural Gas Liquids

There is a very limited supply of natural gas liquids in the country today. The present supply has many critical end-users.



FEA has prepared a short-term forecast of the supply and demand of natural gas liquids, and the adequacy of transportation systems to deliver them to markets. This is being used in developing programs that will facilitate maximum production and proper utilization of this very limited energy resource.

#### Petroleum Development Programs

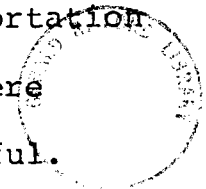
There are several fertile areas available that will enable this country to realize increased domestic oil and gas production. Some of the most obvious and most significant are enhanced oil recovery and exploration and development of potential oil fields in the OCS, Naval Petroleum Reserves, and Alaska.

FEA has sought to achieve timely development of these areas in an environmentally acceptable manner. The resource potential of each source is evaluated, and development progress is measured to insure that unnecessary delays are not encountered. Technical analyses include review of industry oil and gas reserve projections, assessment of OCS leasing plans, and calculation of NPR production potential. Other activities include a determination of the industry profitability in OCS leasing and coordination between DOI and DOD in order to promote exploration of Government-held lands. FEA also monitors the exploration drilling activity by the petroleum industry.

A model providing oil and gas finding and production costs is under development. FEA will utilize data from past exploration and production experience to derive a useful and logical finding cost model. This will enable Government planners to more accurately predict the cost of future oil and gas development under various conditions. This effort will provide an important input for analyzing capital requirements and for developing cost curves used in projecting supply/demand requirements.

#### Petroleum Transportation

There are presently several major facilities being constructed for the transportation of oil. They include the Alaska pipeline, deepwater ports, and oil pipelines. FEA is analyzing the total transportation capacity of the country to determine what proposed facilities are the most logical and will best meet future energy distribution requirements. This activity is conducted in close liaison with the transportation-directed programs of other Federal agencies, e.g., DOT, DOC, and Corps of Engineers. Government endorsement of some of these facilities is becoming a very important element in the eventual construction and completion of transportation projects. FEA will identify candidate projects where Federal assistance or expediting could be very useful.



A special effort is now underway to study the impact of the planned Canadian curtailments on Northern Tier States. Alternatives will be developed for pipeline and distribution system modifications which will compensate for the Canadian action.

#### Petroleum Processing Capacity

Presently, the U. S. is not self-sufficient in refinery capacity. Furthermore, there is considerable interest on the part of oil producing countries to construct several large petrochemical facilities in order to serve U. S. markets. FEA's effort in this area is to identify the problems associated with domestic construction of new processing facilities and to offer assistance as appropriate to alleviate such problems. A semi-annual report on refinery capacity, utilization, and planned construction is prepared and distributed.

#### Coal Utilization and Development

Using the new extended ESECA authority, FEA will continue to press for major fuel users to convert from oil and natural gas in existing plants with coal burning capability and for new plants both to be designed with coal burning capabilities and to burn coal. The ability of utilities to utilize coal is critical since

our coal production will not be increased significantly unless there is a demonstration of increased demand.

Another aspect of coal production is the ability of the Nation's transportation system to move it from mine to market. FEA is involved in analyzing the entire coal supply system and is required to make feasibility findings regarding coal availability before an ESECA conversion order can be issued.

### Coal Mine Expansion

It is apparent from current coal mine expansion plans that traditional development patterns are being changed by the desire of electric utilities to find supplies of low sulfur coal which will meet air quality requirements. The environmental requirements associated with the Clean Air Act have exerted a strong influence on the demand for Western coal which has low sulphur content. Since some 60 percent of estimated coal reserves in the west are owned by the Federal Government, there is an opportunity for the Federal Government to adopt policies which will contribute to the production of



adequate coal supplies. FEA works with the Department of the Interior in the formulation of coal leasing policy for Federal coal resources.

FEA monitors the coal production plans for mining operations on both Federal and non-Federal lands. FEA is concerned that planned expansion of existing mines and development of new mines proceed on an expeditious basis.

#### Socio-economic Impact of Development of Federal Energy Resources

Development of coal or oil and gas from leases on Federal lands can severely impact on rural and undeveloped areas that are unprepared to deal with sudden, rapid growth.

FEA is involved in devising means of assisting states and local communities to alleviate these potentially adverse impacts.

These efforts include work on proposed legislation and making better use of existing mechanisms and programs at the Federal, state, and local level.





Question: 1. "An article in the January 14, 1976 edition of the Washington Star quotes an FEA official as saying, 'current domestic oil consumption is running about 3 million barrels a day below projections made prior to the Arab embargo.' Please provide to us:

(a) the amount in barrels of domestic oil consumption in 1973, 1974, and 1975;

(b) the amount of (mcf) gas consumed domestically for those years;

(c) the amount of domestic oil production from Federal and non-Federal lands and the Outer Continental Shelf for those years;

(d) the amount of domestic natural gas production from such areas for those years;

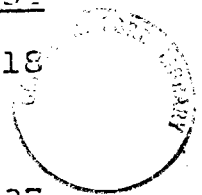
(e) the amount of oil and LNG imported into the United States for those years; and

(f) the current estimates of recoverable domestic oil and gas from Federal lands, the OCS, and other areas."

Answer:

(a) Domestic Oil Consumption

	1973 (MMB/D)	1974 (MMB/D)	1975 (MMB/D)
<u>Domestic Production</u>			
1. Crude Oil	8.784 <sup>1/</sup>	8.373 <sup>1/</sup>	8.000 <sup>2/</sup>
2. Lease Condensate	.424	.392	.367
3. Natural Gas Liquids	<u>1.738</u>	<u>1.688</u>	<u>1.629</u>
Subtotal	10.946	10.453	9.996
<u>Imports</u>			
1. Crude Oil	3.244	3.477	4.082
2. Refined Products	<u>3.012</u>	<u>2.611</u>	<u>1.906</u>
Subtotal	6.256	6.088	5.988
<u>Other Refinery Input</u>	<u>.030</u>	<u>.036</u>	<u>.034</u>
Total New Supply	17.232	16.577	16.018
<u>Other Factors</u>			
1. Unaccounted for Crude	+ .002	- .016	+ .037
2. Processing Gain	+ .453	+ .480	+ .438



	<u>1973</u>	<u>1974</u>	<u>1975</u>
<u>Other Items (Bbl/d)</u>	(MMB/D)	(MMB/D)	(MMB/D)
3. Change in Stocks	-0.135 <u>1/</u>	-0.179 <u>1/</u>	-0.001 <u>2/</u>
4. Crude Oil Losses	-0.013	-0.013	-0.013
5. Exports	<u>-0.281</u>	<u>-0.220</u>	<u>-0.202</u>
Total	17.308	16.629	16.277

(b) Domestic Natural Gas Consumption

	(MMCF/D)	(MMCF/D)	(MMCF/D)
Marketed Natural Gas Production	62,048 <u>3/</u>	59,180 <u>3/</u>	55,153 <u>3/</u>
Imports	+ 2,830	+ 2,628	+ 2,445
Exports	<u>- 211</u>	<u>- 210</u>	<u>- 205</u>
Total	64,667	61,598	57,393

(c) Domestic Crude & Condensate Production

	(MMB/D)	(MMB/D)	(MMB/D)
Federal Land (Onshore)	.571 <u>4/</u>	.571 <u>4/</u>	NA
Offshore Production	1.081	.988	NA
Non-Federal Lands	<u>7.556</u>	<u>7.206</u>	<u>NA</u>
Total	9.208	8.765	8.357 <u>2/</u>

(d) Domestic Natural Gas Production

	(MMCF/D)	(MMCF/D)	(MMCF/D)
Federal Land (Onshore)	3,158 <u>4/</u>	3,381 <u>4/</u>	NA
Offshore	8,799	9,629	NA
Non-Federal Lands	<u>50,048</u>	<u>46,170</u>	<u>NA</u>
Total	62,048	59,180	55,153 <u>3/</u>

(e) Petroleum and LNG Imports

Crude Oil Imports (MMB/D)	3.244 <u>1/</u>	3.477 <u>1/</u>	4.082 <u>2/</u>
Products Imports (MMB/D)	2.957	2.611	1.906
LNG Imports (MMCF/D)	10.137	-0-	NA

Sources:

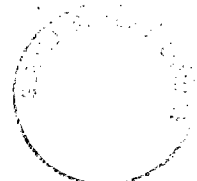
NA - Not Available

1/ - API "Basic Petroleum Data Book"

2/ - American Petroleum Institute

3/ - Oil and Gas Journal, January 26, 1976; 1975 estimated

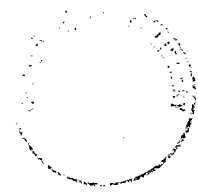
4/ - USGS "Federal and Indian Lands Oil and Gas Production, Royalty Income and Related Statistics"



(f). Recent estimates by the U. S. Geological Survey in Circular 122 do not break the recoverable resource of oil and natural gas down into Federal and non-Federal areas. These estimates, presented as of December 31, 1974, are the most current available.

Reserves and Undiscovered Recoverable Resource of Oil and Natural Gas in the United States

Oil - Petroleum Liquids	
Total (Onshore and Offshore)	172 billion barrels
Offshore	32 billion barrels
Natural Gas	
Total (Onshore and Offshore)	923 trillion cubic feet
Offshore	210 trillion cubic feet



Question: 2. What is FEA's most recent assessment of the Nation's mineral position, not only of fossil fuels, but of all minerals?

Answer: Mineral resources and mineral statistics do not fall under the jurisdiction of FEA. This question can be best answered by the Department of the Interior, U.S. Bureau of Mines.



Question: 3. "Please describe to us FEA's research, development and demonstration budget requests for FY 1977 for fossil energy and the purpose and objectives of the budget requests."

Answer: FEA does not conduct research, development and demonstration activities in the fossil fuel area.



Question 4: We understand that there is a decline in coal production. What are the reasons for this? What are the principal domestic and foreign coal markets? What is FEA doing or does it plan to do with its FY 1977 budget to provide additional coal markets? What is the status of efforts to convert electric utility plants from oil to coal?

Answer: Coal production is not declining. On the contrary, in 1975 the production of bituminous coal and lignite reached a record 640 million tons (preliminary estimate) an increase of 6% over 1974 and surpassing the previous record of 631 million tons set in 1947.

The principal domestic markets for coal with estimated 1975 consumption are:

Electric Utilities	-	405	million tons
Coking Coal	-	83	" "
General Industry	-	64	" "
Retail	-	7	" "
Other	-	10	" "

In 1975 the U.S. exported an estimated 65 million tons of coal to foreign markets. Of this 70-75% was metallurgical coal. Preliminary estimates of coal shipments to foreign markets in 1975 are:

Canada & Mexico	-	17	million tons
Asia	-	26	" "
Europe	-	20	" "
Other	-	2	" "



The Energy Policy and Conservation Act extended the Energy Supply and Environmental Coordination Act conversion authority to mid-1977 and FEA's enforcement authority to 1985. Under this authority, FEA will continue to issue conversion orders to those electric utilities and major fuel burning installations which have coal burning capabilities, and satisfy the criteria established by ESECA.

Of the 32 generating stations given conversion orders under the original ESECA legislation, 6 to 8 are now converting. The Environmental Protection Agency is developing certifications pursuant to Section 119 of the Clean Air Act. Concurrently FEA is preparing Environmental Impact Statements or Environmental Assessments for prohibition order recipients. Notices of effectiveness will be issued when these actions are complete.



Question: 5. "We understand that the FEA has established a computerized fuel data bank.

- (a) Please describe the bank.
- (b) Is the computer work done entirely within the FEA or is some part of it contracted out? Please give details.
- (c) What is the annual cost of this bank?
- (d) What effort is made to coordinate this bank with the Bureau of Mines? What data is collected by FEA and by the Bureau?"

Answer: The data bank to which you are apparently referring is known as the Joint Petroleum Reporting System. It is being designed to furnish monthly reports on supplies and disposition of petroleum and petroleum products. The reports essentially will track the petroleum from crude oil stock, through pipelines and refineries, and into finished stocks. The reports will cover the fifty states and, where relevant, the District of Columbia and the Virgin Islands. They also will give product-by-product details.

The specific titles of the monthly reports are:

- (1) Crude Oil Stock Report, (2) Products Pipelines Report,
- (3) Refinery Report, and (4) Bulk Terminal Stock of Finished Petroleum Products Report.



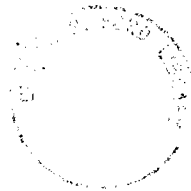


The computer programs for editing the data are being written under contract by IBM. When written and debugged, these programs will be operated by the Bureau of Mines on their own computer. FEA may assist, occasionally, in the analysis of the data.

The annual cost cannot be determined at this time. The system is to become operational on March 1, 1976. After that date, the Bureau of Mines will keep track of and pay for the annual operating costs.

Data for the bank are collected under an interagency agreement between the FEA and the Bureau of Mines. The agreement provides that FEA design the data collection forms which are distributed by the Bureau of Mines as FEA's agent.

Responses from the reporting companies come to the Bureau of Mines.



Question: We note that ERDA and other agencies cost share some of their research, development and demonstration work. What are the FEA statutory or administrative guidelines or criteria including the percentages, for such cost sharing and the origin and rationale for such cost sharing? To what extent is this research, development and demonstration effort for the use of the Federal Government? Has industry expressed approval of the FEA cost sharing arrangements for pilot and demonstration, or has industry suggested changes in cost sharing particularly where the research and development benefits industry primarily? Please explain your reply.

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Answer: When the Federal Energy Administration was created, the Congress did not charge it with the responsibility for research, development and demonstration. FEA does not have a program for cost sharing of research, development and demonstration work with other agencies.



Question:

7. Our Subcommittee, in reviewing the fossil energy research and development programs, has been concerned that there may be overemphasis on energy problems of the future and very little emphasis on the near-term energy problems and solutions. We are particularly concerned because as the energy budget increases, as it has over several fiscal years, the public will expect some visible and tangible results. There is little evidence in the ERDA plan and program that would indicate that much will, in fact, be achieved soon. We note that the Office of Technology Assessment in its October 1975 report on the ERDA plan expressed a similar concern. Indeed, the OTA contends that only 5 percent of the FY 1976 budget "is devoted to solving near-term problems."

(a) We would like your comments on this problem.

(b) What portion of the FY 1977 FEA budget is devoted to near-term problems in the nonnuclear area and what specific problems will the budget address? What is FEA's role in long-term problems?

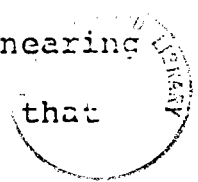
(c) What in your view are some of these problems that are not adequately addressed by the FY 1977 budget and what should be done to increase attention to these problems by your agency and others?

Answer: The basic rationale for Federal Government support of energy Research, Development and Demonstration (RD&D) is not only that the benefits to be obtained are in the overall national interest but that the work to be undertaken is of such a character that the private sector is unlikely to make the necessary investment of funds. Generally, if RD&D has a relatively high probability of achieving a near-term payoff, private industry will invest the necessary funds with the expectation of receiving a return on the investment within a reasonable period of time. The Federal Government, therefore, generally directs its RD&D investment into areas with a relatively

longer lead time or otherwise of such a nature that private industry will not act. An example of this is the development of first generation synfuel processes are funded by private industry. Whereas second generation processes are largely Federally funded. First generation processes are those on the verge of commercial acceptance while the use of second generation processes is considerably in the future.

FEA does not, of course, have a statutory charter for energy research and development with respect to hardware or technologies. In general, FEA is devoting a substantial portion of its budget to near-term problems in the regulatory, conservation, and resource development areas. In the latter category, FEA is devoting particular attention to the resolution of institutional barriers to the use of the Nation's energy resources. In addition, we are seeking out specific energy projects that are experiencing difficulties and, after determining that action by the Federal Government is appropriate, acting to resolve the problems.

Regarding long-term problems, FEA is playing a primary role in projecting the future supply of energy from a variety of sources together with the demand that is likely to exist. Incident to the process, constraints are identified and highlighted for appropriate action. A revision of FEA's Project Independence Report, originally published in the fall of 1974, is now nearing completion. This Report will identify some problem areas that need to receive increased attention.



ERDA does research and technological work which is aimed at commercialization within 5 years. That Agency also does research in management and commercialization which can have immediate implications for energy resource development and conservation. The program planning staffs of FEA and ERDA are working together to come to a formal understanding of the responsibilities of the two agencies. This interface should preclude any overlaps in activities.



Question: 2(a) How are the research, development and demonstration priorities in the fossil and environment and safety energy areas established by FEA, how often are they reviewed, and what input does the public have in establishing these priorities?

Answer: R,D&D priorities are not established by FEA. However, FEA participates in the review of ERDA's formulation of priorities and makes recommendations for change as may be appropriate.



Question: Qb. (i) "How are future projections of energy demands arrived at by FEA and other Federal agencies?"

(ii) "What is the current FEA thinking concerning these demands for 1985, 1990, 1995 and 2000?"

(iii) "Do all Federal agencies agree with these demand estimates?"

(iv) "How do these projections affect FEA's RD&D priorities?"

Answer: (i) FEA uses an econometric model known as the demand model of the Project Independence Evaluation System. The model projects demands for various forms of energy at given selling prices. ERDA is presently considering the use of these figures as a basis for its own demand estimations. The Bureau of Mines makes its projections largely through the use of expert opinion.

(ii) Projections of energy demand depend upon many factors, including assumptions concerning Government policy and, particularly, assumptions about energy prices. A full report representing an update of Project Independence will be forthcoming soon. This report describes energy demand and supply under a variety of alternative futures. The reference case projections of gross energy consumption are:

1985	98,866 trillion Btu
1990	116,109 trillion Btu

FEA has not made demand forecasts beyond 1990.

(iii) Not completely, because of the different bases for making the projections. (For an instance of agreement, however, see the answer to question 12.)



(iv) Research, Development and Demonstration (RD&D)

programs are usually carried out by ERDA rather than FEA.





Question: 9. "To what extent does FEA use net energy analysis in emphasizing technologies? Does the FEA budget have funding for work in this area, and what are the advantages and disadvantages of this analytical approach?"

Answer: FEA primarily uses economic analysis rather than net energy analysis as a guide to technology emphasis. Occasionally FEA uses net-energy analysis as in its forthcoming report, "Net Energy from Nuclear Power."

Net energy analysis is a useful concept in evaluating the efficiency of a technology. Efficiency, however, is not the whole story. Some forms of energy are more valuable than others and, with all costs fully internalized, rational decisions can be made on an economic basis. For example, the production of synthetic gas from coal is less efficient than direct coal combustion, but may be preferred in some cases because of the economic cost of meeting environmental standards when burning coal.



Question: 10. "A January 14, 1976 report of the GAO entitled 'Implications of Deregulating the Price of Natural Gas' states (pp. 23-24):

Deregulation is not expected to result in any increased high-Btu gas production by 1985 and may even result in a reduction should lower 48 production greatly increase.

"We would appreciate your views and comments on this statement. Also, please provide to us your views as to what effect deregulation of natural gas would have on encouraging greater use of coal for power generation, industrial, and other uses."

Answer: Presently, the cost for high-Btu gas manufactured from coal is between \$2.60 and \$3/Mcf and escalating. We do not anticipate natural gas to ever reach this price level upon deregulation. In that deregulation will result in additional supplies of natural gas, and such supply will be at a lower price than SNG, we should not think deregulation would in any way increase high-Btu gas production by 1985.

We envision that the deregulation of natural gas would result in a greater utilization of coal for power generation, industrial, and other uses. Presently, there is between 2 and 3/Tcf of gas used each year in the Southwestern region of this country for utilities or large industrial uses. Upon deregulation, we would expect to see interstate gas transmission companies purchasing that



gas from the present consumers. The price that would be paid would be that which would compensate the present consumer for all the cost involved in switching to oil or coal. In that coal offers a lower cost alternative to oil in many instances, we would expect to see coal utilization increase as the natural gas consumption pattern is altered.



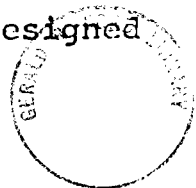
11.

FEA or others concerning the possibilities of the leading natural gas consumption industries (mentioned in the GAO report, page 49) switching to coal or other fuels and the obstacles or constraints to such switching. What were the findings? If none were conducted, should such studies be conducted, who should do them, how much would they cost, and how long would they take?

Answer: FEA's Office of Fuel Utilization conducted a mandatory survey in mid-1975 of all industrial combustors with a design firing rate of 100 million BTU's/hr or greater. The responses suggested that conversion to coal would yield a potential savings of 283.324 billion cubic feet per year by converting gas-fired units originally designed to burn coal. These units were located primarily in the chemicals, primary metals, and paper industries.

The study indicated the principal obstacles to all gas-to-coal conversions include the:

1. Fuel cost differential favoring natural gas over coal.
2. Significant capital expenditures for acquiring coal-handling equipment and pollution control devices.
3. Overly stringent (from the industrial viewpoint) or unclear environmental standards to be met when burning coal.
4. The absence of a Federal commitment to increasing the coal supply.
5. Technical difficulties encountered in converting from gas to coal if the combustor was not originally designed



to burn coal (e.g., tube spacing).

6. Process requirements necessitating "clean" fuels (e.g., glass products finishing) or precise temperature controls (e.g., metal heat treating or paper drying).

In addition, more detailed data will become available pending further analysis of the industrial survey. Moreover, this problem will be studied in greater depth as part of a \$240,000 FEA-contracted effort to be completed by December 1976.



Question: 12. "A recent Bureau of Mines report predicts a large increase in energy consumption through the midterm, according to press accounts. What are FEA's views on this?"

Answer: The Department of the Interior's recent update of "United States Energy Through the Year 2000" predicts that total gross energy consumption in the United States will increase to 103,540 trillion Btu by 1985. This prediction agrees essentially with FEA's Project Independence forecast for 1985, which predicts a consumption level of 93,866 trillion Btu.



Question: 13. How does FEA plan to encourage industry to participate in the development of new and existing technologies such as the development of synthetic fuel plants?

Answer: Under law ERDA holds prime responsibility for working with industry in the energy R&D area. FEA supports the Administration's synfuels commercialization program and advocates Federal policies such as free markets, reasonable environmental tradeoffs, and a general climate that will encourage business to voluntarily participate in improving the country's domestic energy self-sufficiency.



Question: 14. "How reliable are Federal energy resource estimates for petroleum and natural gas?"

Answer: During 1975 the Federal Energy Administration (FEA) submitted to the Congress its initial and final reports on crude oil and natural gas resources, reserves, and productive capacities. The initial report contained estimates of domestic oil and gas resources and preliminary reserve estimates. The final report contained revised figures for domestic reserves.

Based on a survey of all oil and gas field operators in the United States, estimated domestic proved reserves as of December 31, 1974, were 38.0 billion barrels of crude oil and 240.2 trillion cubic feet of natural gas. The American Petroleum Institute (API) report showed comparable crude oil reserves of 34.2 billion barrels, 10 percent less than the FEA survey. The American Gas Association (AGA) estimated comparable natural gas reserves of 233.2 trillion cubic feet (after deducting 3.9 trillion cubic feet that was in underground storage), 2.9 percent less than the FEA survey. These estimates vary no more than might be expected when comparing estimates from different sources.



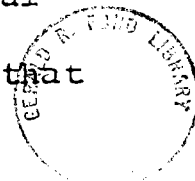


Both the FEA reserve estimates and the estimates published by industry trade groups define proved reserves as those oil and natural gas resources that have actually been discovered and can be produced under current economic and technological conditions.

The FEA estimate of indicated crude oil reserves--quantities of oil believed to be economically producible from known reservoirs using proven, but not yet installed recovery technology--as of December 31, 1974, was 4.1 billion barrels of crude oil. The API estimated comparable indicated reserves of 4.6 billion barrels, 12 percent higher than the FEA survey.

The resource estimates for crude oil and natural gas prepared for the FEA by the U.S. Geological Survey (USGS Circular 725) are the most reliable estimates currently available. The USGS estimated that the total of inferred reserves and undiscovered recoverable resources probably equals 105 billion barrels of oil and 686 trillion cubic feet of natural gas using current technology.

Estimates such as these are subject to wide estimating errors. There are 19 chances in 20 that the oil potential may be at least 73 billion barrels and one chance in 20 that



it will be as much as 150 billion barrels. Similarly, estimates of natural gas potential range from 524 trillion to 857 trillion cubic feet.

In addition, from 17 to 28 billion barrels of natural gas liquids may be recoverable from the processing of natural gas which may be produced from as yet undiscovered reservoirs. The most probable estimate of natural gas liquids recoverable from this source is 22 billion barrels.

The resource estimates prepared by USGS are markedly lower than those that it has previously published.



Question 15: The Office of Technology Assessment's October 1975 report on the ERDA plan states:

A shift from the use of crude oil and natural gas, imported or domestic, to the use of coal and synthetic fuel products from coal will make heavy demands on existing transportation systems. The rail network, which moves most of the Nation's coal, will be especially affected. In order to avoid major constraints on the application of improved fossil fuel technologies, ERDA needs to anticipate the commodity movements that may be required and to assure that necessary additions to or changes in present transportation systems are brought about.

- (a) Do you agree?
- (b) To what extent are changes in transportation capabilities needed to facilitate use of coal, etc., and to what extent are these changes a regulatory problem and a technology problem?

Answer: The shift from the use of crude oil and natural gas to the use of coal will be a slow one even under the most optimistic assumptions. Existing electric utilities and industrial boilers which now use crude oil and natural gas cannot shift to coal unless these boilers were originally designed for coal. This means that most facilities will have to build entirely new boilers in order to use coal.



The construction of coal-fired boilers is a major undertaking today. It requires from 5 to 10 years to plan and build a major coal-fired installation. The transportation system for coal on the other hand, is normally a far simpler matter. Hopper cars can be delivered within two years of the order, at most. Track can be rehabilitated or expanded in a similar time span. In many cases there is more than one route for the movement of coal and more than one source for the coal. Normally the planning for coal transportation is an integral part of the planning for construction for any major coal burning installation. For this reason, it is unlikely that major coal movement problems could develop which were unforeseen by and which could not be solved by the producers and consumers of coal working together with appropriate railroads in the planning phases of any major coal burning installation.

In other words, most current studies indicate that in general, coal transportation is unlikely to be a significant constraint upon the expansion of the use of coal, but there may be important regional and local transportation problems.

FEA is continuing to monitor the coal delivery system in conjunction with the Department of Transportation, the Corps of Engineers, the Association of American Railroads



and others. FEA supported the passage of the Railroad Revitalization and Regulatory Reform Act of 1976 which involves regulatory reform and funding for rehabilitation as well as other measures to improve coal transportation.

We believe changes needed in transportation capabilities are much more a regulatory problem than a technology problem.



Question: 16-1. In light of the recent action by Congress to strike a proposed loan guarantee program from the ERDA Authorization Act for FY 1976, does the FEA continue to support a loan guarantee and price support program for the commercialization of synthetic fuels?

Answer: ° Despite recent Congressional action in striking down ERDA's proposed loan guarantee plan for FY 1976, the FEA believes that Federal incentives are desirable to bring at least a few commercial sized synthetic fuels plants into operation.

° The point becomes particularly pertinent due to probable limited future cash flow for the petroleum industry (that sector of the energy industry with sufficient financial resources to possibly support \$1 billion plus projects) resulting from the recently enacted Energy Policy and Conservation Act (Public Law 94-163).

° FEA believes the overriding consideration at this time is to start construction of one or two high BTU gas from coal plants and one or two shale oil plants, utilizing best available current technology to "see how they run," and gain experience in how best to commercialize the synthetic fuel industry so badly needed by the country, at the same time minimizing adverse environmental effects.

° If we wait for perfect technology and a perfect overall long-term plan it seems unlikely that we will develop a synthetic fuels industry in time to meet the needs of the country.

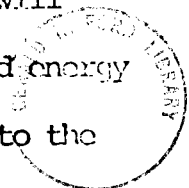


° The modest positive start just indicated would not preclude continuing planning, technology study, and coordination of involved agencies with Congress aimed toward effecting a more comprehensive program, if, and as soon as practicable.

° Escalating construction costs suggest that high BTU gas from coal may sell in the range of \$2.60 to \$4.85 per MCF versus the current average regulated interstate price of around \$0.52 per MCF. Shale oil may sell at a minimum of \$12.70 per barrel versus the newly enacted (Public Law 94-163) allowed average \$7.66 per barrel and a foreign oil price of around \$11.50 to \$13.75 per barrel delivered to the U.S. coast. These estimated costs were recently developed by an interagency Synthetics Fuels Task Force and are represented in 1975 dollars.

° Under such economic and pricing conditions, together with the outlook for petroleum industry cash flow previously referred to, FEA feels that some immediate Federal financial aid is necessary to enact a limited start toward a synthetic fuels industry.

° Many time consuming questions must be resolved before construction can begin, even if Federal financial assistance is authorized; and 2-4 years actual construction time will be required depending on the project. The economic and energy supply atmosphere two or three years out could change to the



point that major additional Federal incentives will be unnecessary. In any event, at that time we can more adequately assess the necessity, direction and magnitude of Federal efforts to support commercialization of synthetic fuels from coal and shale.

° It could even be that successful synfuels production from a limited number of plants will minimize or remove the necessity for additional Federal financing of a developing synthetic fuels industry at that time.





Question: 16-2. If your reply is in the affirmative, do you continue to believe that such a commercialization program should be administered by ERDA?

Answer: The FEA agrees that ERDA should administer the synthetic fuels commercialization program for the present. The synthetic fuels program should then be transferred to the Energy Independence Authority when the authority is established.

Of course, FEA will cooperate with ERDA and EIA with respect to other commercialization efforts which are developed subsequently.



Question: 17(a). What is FEA doing about the difficulties of siting outside the proposals in the President's EIA legislation last year?

Answer: FEA has: (1) worked on the siting problems holding up individual energy facilities to better understand the problems and help expedite these facilities; (2) worked with states on their input and analysis of energy centers, water allocation for energy, coastal zone management, and long range state energy planning and siting requirements and problems; (3) initiated studies of the scheduling and information requirements of energy applications to identify and reduce regulatory redundancy and overlap; (4) worked with GSA on disposal of Federal property and identification of excess or surplus property that has potential value for siting energy facilities; and (5) initiated a review of proposed national siting legislation.



Question: 17(b). The FEA participated in several discussions with Western Governors concerning impact of these facilities in states and communities. What is FEA doing as a result of those discussions to resolve these problems legislatively and otherwise?

Answer: The Administration, with FEA input and support, has submitted proposed legislation to provide impact aid assistance for communities effected by energy resource development on Federal lands. Recently Bill Rosenberg, the Assistant Administrator for Energy Resource Development, met with Representatives of Rocky Mountain and Coastal states to discuss the content of the proposed legislation. Furthermore, FEA's Region VIII Office is continuing to work closely with the Western Governors on community impact aid problems.



Question: 17(c). Does FEA have a master plan where future energy facilities would be sited to provide the targeted needs or demands?

Answer: No. FEA, from its "PIES model," is developing regional supply/demand models which will estimate future demand for energy facilities and energy sites. FEA believes it is the basic responsibility of states to identify where future sites should be located and FEA is attempting to work with interested states in helping the states do this.



Question 18: What is the current status of your work with the Bureau of Mines (1975 Hearings, p. 169) re: double froth flotation method of removing clays, etc., from coal?

Answer: The extent of FEA's work with the Bureau of Mines was limited to the interchange of technical information and the dissemination of information to industry. FEA has always recognized that BOM (now ERDA following the transfer of these activities) had the research responsibility in this area.

Question: 19. What is the current status of your work with the Bureau on the conservation and use of methane from coal mines?

Answer: During FY 1975, FEA worked closely with the Bureau of Mines in introducing the concept of coal seam methane conservation in the Commonwealths of Pennsylvania and Virginia; also the State of West Virginia.

Pennsylvania now has a formal plan (Pennsylvania Methane Plan) for the development of the Commonwealth's coal seam methane resources. Virginia's Coal and Energy Commission has held two meetings regarding methane conservation. The first meeting was attended by FEA alone, the second in conjunction with the Bureau of Mines. Virginia is now considering future courses of action. In West Virginia, we have met with a number of state energy officials in the presence of a representative of the Bureau of Mines.



Question: 20. What is the status of work on the question of price alternatives for oil and gas recovery technologies and for synthetic fuel development?

Answer: There is no commercial production of synthetic fuels from coal or oil shale in the United States at the present time. It is our best estimate that without Federally provided incentives, no significant production of synfuels will take place between now and 1985. Because of the long lead time before synthetic fuel plants can start making a contribution to our energy supply, the Administration believes it is vitally important that the initial plants receive Federal support to get them underway as soon as possible. This is especially important because the initial plants are one-of-a-kind and involve unusual risks.

It is our belief that sometime in the mid 1980's a synthetic fuels industry will be commercially competitive and that Federal incentives will no longer be necessary to encourage production.

The basic forms of financial assistance which we feel would most effectively encourage private investment in synthetic fuel plants are: loan guarantees, price guarantees and construction grants. The specific incentive to be used for a particular plant would be designed to share the risk associated with the initial plants between the developer, the Government, and to a much lesser extent the consumer.

With respect to oil recovery technology, Title IV, Section 401, of the recently Enacted Energy Policy and Conservation Act



(PL 94-163) concerns pricing policy. Implementing action is for the various aspects of this section of the Act are under consideration at this time.

Regarding gas recovery technologies, deregulation of the price of new gas sold in inter-state markets remains as a key objective of the Administration's energy policy.





Question 21-a. We have received some agency comment that this approach (50-50 grant) is too rigid. What are your agency's views on this cost sharing policy? Is it, in fact, sound? Why?

21-b. What are the advantages and disadvantages to the Government if one of the following alternatives were to be adopted either by statute or administrative action?

Answer: Because FEA has no research development and demonstration role, this question should be reserved for response from ERDA.

