REPORT OF THE COMPTROLLER GENERAL OF THE UNITED STATES

Comments On The Administration's Proposed Synthetic Fuels Commercialization Program

Energy Research and Development Administration

Proposals providing for Federal assistance to aid industry in constructing and operating a limited number of synthetic fuel commercial demonstration facilities have been or are being considered by the Congress.

Before legislation is enacted authorizing a synthetic fuels commercial demonstration program, the scope and magnitude of Federal assistance needed to carry out such a program should be more clearly delineated and justified.

Congress could consider the commercialization program under the purview of the proposed Energy Independence Authority.

RED-76-82

MARCH 19, 1976

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-178205

The Honorable Ken Hechler
Chairman, Subcommittee on Energy
Research, Development, and
Demonstration (Fossil Fuels)
Committee on Science and Technology
House of Representatives

Dear Mr. Chairman:

This report evaluates a proposal which would have authorized a loan guarantee program for commercial synthetic fuel demonstration facilities and discusses the Administration's efforts for implementing such a program. We made the review in accordance with your request of January 16, 1976, as modified in a subsequent discussion with your office. Even though the proposed legislation was rejected by the Congress, your office felt it would be useful for us to comment on that legislation because it is anticipated that some of the same provisions in the legislation will be reintroduced in the current Congress.

As your office requested, we have not obtained formal agency comments. However, we discussed the matters presented with agency officials and have considered their comments in the report.

As agreed with your office, we plan to distribute copies of this report to other interested congressional committees and to the Energy Research and Development Administration.

Sincerely yours,

Comptroller General
of the United States

C O N T E N T S

ABBREVIATIONS

EIA	Energy Independence Authority
ERDA	Energy Research and Development Administration
GAO	General Accounting Office

COMPTROLLER GENERAL'S REPORT TO THE SUBCOMMITTEE ON ENERGY RESEARCH, DEVELOPMENT, AND DEMONSTRATION (FOSSIL FUELS), COMMITTEE ON SCIENCE AND TECHNOLOGY, HOUSE OF REPRESENTATIVES

COMMENTS ON THE ADMINISTRATION'S PROPOSED SYNTHETIC FUELS COMMERCIALIZATION PROGRAM

Energy Research and Development Administration

D I G E S T

Three-fourths of the Nation's energy consumption is based on petroleum and natural gas--both of which are limited and expected to provide a smaller portion of the Nation's energy needs in the future.

Consequently, the Nation's reliance on foreign imports of energy will continue to climb. (See p. 1.)

In his 1975 State-of-the-Union Message, the President called for Government financial and other incentives to stimulate industry investment in developing and demonstrating the commercial viability of synthetic fuels. A large portion of these fuels would be derived from the country's abundant supply of coal and oil shale. The President set a goal to produce the equivalent in synthetic fuels of 1 million barrels of oil a day by 1985. (See p. 4.)

An Interagency Task Force on Synthetic Fuels Commercialization was established in February 1975 under the aegis of the Energy Resources Council. The Task Force was assigned responsibility for determining and developing the various facets associated with the commercialization of synthetic fuels. (See p. 4.)

The Task Force concluded that in the absence of Federal incentives and changes in regulatory policy, significant amounts of synthetic fuels are not likely to be produced in the U.S. by 1985. (See p. 4.)

To achieve the President's goal, the Task Force recommended a two-phased program. The first phase would be aimed at developing information on, and demonstrating, the technical, economic, and environmental feasibility of commercial-scale plants using available technologies. (See p. 5.)

It further recommended that the following government incentives would be needed to encourage industry to participate in phase one: loan guarantees, construction grants, and price supports. (See p. 6.)

The President designated the Energy Research and Development Administration to implement phase one and the Task Force recommended that the Nonnuclear Energy Research and Development Act of 1974 be amended to provide the Energy Research and Development Administration with the authority to make loan guarantees. (See p. 7.)

A proposal was introduced during the 94th Congress, 1st Session, which would have authorized the Energy Research and Development Administration to provide up to $6 billion in loan guarantees for

--the construction and start-up costs of commercial demonstration facilities for the production of synthetic fuel from coal, oil shale, biomass, and other domestic resources;

--the construction and start-up costs of commercial demonstration facilities for generating energy from solar, wind, geothermal, and other renewable resources;

--financing the purchase, construction, installation, and start-up costs of energy-efficient industrial equipment and facilities for commercial demonstration; and

--financing essential community development and planning which directly result from, or are necessitated by, one or more commercial demonstration facilities.

The Energy Research and Development Administration

--recognizes that construction of plants using currently available processes are limited from an economic and environmental standpoint;

--believes that the major contribution from these plants is the economic and environmental information that will be generated in locating and operating these plants; and

--believes this information would pave the way for industry and governmental regulatory bodies' involvement in the commercialization of a large number of coal gasification and oil shale plants. (See p. 9.)

Along with phase one, the Energy Research and Development Administration would also be performing research and development on synthetic fuel technologies. Such work is aimed at refining the technologies to bring down the costs and enhance the environmental suitability of these synthetic fuel plants. (See p. 9.)

Because of refinements which could be made to existing technologies, close scrutiny should be given to the number and size of plants proposed by the Energy Research and Development Administration if phase one is authorized.

Similarly, if phase one is authorized, close scrunity should also be given to the information obtained under this phase before authorizing the possible second phase of the synthetic fuels program. (See p. 17.)

In anticipation of legislation authorizing phase one, the Energy Research and Development Administration plans to augment the Task Force report by completing various studies. These studies are planned to be completed by July 1976 and are generally aimed at

--undertaking strategy and policy analyses necessary for program implementation;

--initiating long lead-time activities related to program implementation (such as environmental impact statement finalization, program regulations); and

--informing the public, Congress, States, and other groups about the proposed program and respond to requests as needed.

Given the objectives of these studies, Congress should consider awaiting their completion before considering legislation authorizing a commercial demonstration program.

The studies should provide the Congress better information for determining whether, and to what extent, Federal assistance should be authorized to carry out phase one of the program. (See p. 17.)

In this regard, Congress should consider requiring the Energy Research and Development Administration to:

--Delineate and justify the scope and magnitude of Federal assistance it feels will be needed to carry out phase one of the program. (See p. 18.)

--Justify the type and number of plants it will need to accomplish the objectives of phase one of the program. (See p. 18.)

Legislation is currently before the Congress which would establish an Energy Independence Authority.

The question of Government assistance for encouraging the commercialization of synthetic fuels technologies could be considered within the broader scope of the Authority proposal, which covers all forms of energy supply, rather than a select few and could be expanded to cover energy conserving technologies. (See p. 18.)

Because of time constraints, GAO did not evaluate the pros and cons of the various alternatives considered by the Task Force for carrying out a synthetic fuels commercialization program. Accordingly, GAO is not in a position to comment on the appropriateness of the alternatives recommended by the Task Force.

It should be noted, however, that in several instances, the considerations used by the Task Force were judgmental in nature. A different emphasis on such considerations could

conceivably lead to a different choice of alternative forms of assistance. (See p. 18.)

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--Reduce the reliance on and use of special benefit payments which bypass standard computer screening controls intended to prevent overpayments. (See p. 21.)

--Increase the use of teletype transmissions of stop-payment notices to prevent overpayments. (See p. 23.)

VA needs to act quickly on GAO's recommendations; however, the Congress also may have to reconsider the merits of prepaying veterans for training, as authorized under Public Law 92-540, and return to a post-payment system for educational benefits. (See p. 26.)

Overpayments remaining uncollected have also increased dramatically, from $8.4 million at June 30, 1970, to $298 million at December 31, 1975. (See ch. 6.)

VA should improve collection actions by

--revising collection letters (see p. 34),

--taking faster action to collect (see p. 35), and

--establishing an automatic cross-checking system for matching veterans receiving benefit payments under other programs so that collections can be accomplished by offset (see p. 36).

VA did not disagree with GAO's findings on the causes of overpayments and is taking actions toward solving these problems. (See ch. 7.)

CHAPTER 1

INTRODUCTION

Three-fourths of the Nation's energy consumption is based on petroleum and natural gas. Both of these resources are limited and expected to supply a smaller portion of energy needs in the future. As domestic supplies of these two fossil fuels dwindle, imports of petroleum, petroleum products, and natural gas continue to climb.

Coal and oil shale are two of this Nation's most abundant energy resources. The technologies for converting coal into synthetic liquid and gaseous fuels and extracting oil from oil shale are getting attention in this country today because they could help in reducing our dependence on foreign sources of energy. In addition, biomass conversion--converting municipal and agricultural wastes into synthetic fuels--could become a small but locally useful energy source and accordingly, more interest is also being focused on developing this technology.

Technically feasible coal gasification and liquefaction processes have been available for years. Historically, these processes have been too expensive to compete favorably with the cost of producing conventional gas and oil. Although oil shale conversion processes have not been tested on a commercial scale, one conversion process seems to be sufficiently developed and ready for commercial application.

The following presents a brief description of the synthetic fuel technologies discussed in this report.

COAL GASIFICATION

To convert coal to synthetic gas, coal is fed into a high-temperature pressurized reactor, along with steam and air or oxygen. A chemical reaction occurs and a mixture of gases is produced. The gases produced include carbon monoxide, hydrogen, and methane. Methane is the main constituent of natural gas. The gases are then cooled and undesirable components, such as carbon dioxide and sulfur, are removed. The raw gas produced at this point is referred to as low-Btu[1] gas or utility/industry substitute fuel. This gas has a low heat content compared to natural

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[1]The Btu, or British Thermal Unit, is a common measure of heat.

gas, and cannot be economically transmitted by pipeline. It is valuable, however, as a fuel for electrical power generation plants and industrial applications.

Low-Btu gas can be upgraded to a gas referred to as high-Btu gas, which has approximately the same heat content as natural gas, through a process of adding additional hydrogen to the gas, referred to as methanation. High-Btu gas is a substitute for natural gas and can be transmitted in existing networks of pipelines to satisfy the demands of present users of natural gas.

OIL SHALE

Oil shale is a marlstone, composed mostly of clay that contains an organic material called kerogen. When the kerogen is heated to about 900°F in a large vessel called a retort, it is converted to shale oil and gas. The gas can be recycled and used to heat additional shale. Although the shale oil that is derived from kerogen is low in sulfur and varies in some respects from conventional petroleum, it can be refined into most petroleum products.

COAL LIQUEFACTION

Coal liquefaction is the process of converting coal into a liquid fuel. There are several different processes for producing liquids from coal. Some processes burn coal, condense the resulting gases, and add hydrogen to form a liquid, whereas other processes chemically dissolve coal with hydrogen to form a liquid.

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In a letter dated January 16, 1976, the Chairman, Subcommittee on Energy Research, Development, and Demonstration (Fossil Fuels), Committee on Science and Technology, House of Representatives, asked us to examine a number of issues related to the development of synthetic fuels. However, because of tight deadlines, we agreed with the Chairman's office that our review would

--describe the current status and goals of coal gasification, coal liquefaction, and oil shale conversion technologies,

--analyze certain features contained in legislation (H.R. 3474, Section 103) introduced, but not enacted, in the 1st session of the 94th Congress, and

--comment on the desirability of providing Government incentives to the private sector under the synthetic fuels program.

The Chairman's office felt it would be useful to comment on the proposed legislation even though it was rejected by the Congress because it is anticipated that some of the same provisions in the legislation will be reintroduced in the current Congress.

SCOPE OF REVIEW

We made our review at the Energy Research and Development Administration (ERDA) headquarters in Washington, D.C., where we reviewed pertinent legislation, ERDA documents and reports, the report of the Interagency Task Force on Synthetic Fuels Commercialization, and interviewed ERDA officials.

Because of time constraints, we did not evaluate the pros and cons of the various incentives considered by the Interagency Task Force for encouraging the construction and operation of commercial-scale synthetic fuel plants.

CHAPTER 2

ADMINISTRATION'S EFFORTS FOR ACCELERATING COMMERCIAL VIABILITY OF SYNTHETIC FUELS

In his 1975 State-of-the-Union Message, the President called for accelerated development of our energy technology and resources and proposed a set of energy supply and conservation measures to reduce the United States' dependence on foreign oil by 1985. As part of these measures, he proposed that the Government provide financial and other incentives to stimulate investment in a number of commercial-scale synthetic fuel plants. In addition, he set a goal to produce an equivalent in synthetic fuels of 1 million barrels of oil a day by 1985.

In response to the President's goal, an Interagency Task Force on Synthetic Fuels Commercialization was established in February 1975 under the aegis of the Energy Resources Council to

--evaluate economic and environmental costs and benefits of alternative size programs from a national viewpoint and recommend an appropriate size synthetic fuels program,

--develop detailed incentive program plans to insure the recommended level of synthetic fuel capacity by 1985, and

--formulate budgetary, legislative, organizational, management, and other measures needed for expeditious implementation.

In November 1975, the Task Force concluded that:

--Based on present information including industry plans, without Federal incentives and changes in regulatory policy with regard to synthetic gas and without change in other policies creating a stable and favorable synthetic fuels investment environment, significant amounts of synthetic fuels are not likely to be produced in the U.S. by 1985. This conclusion stems primarily from the anticipated cost of synthetic fuels and from the risk associated with large synthetic fuel plant investment in light of the uncertainty of future world oil prices.

--Based on current estimates of long-range domestic demand and supply, it is projected that synthetic

fuels will need to be introduced in the 1985 to 1995 time frame. Estimates of 1995 U.S. demand for synthetic fuels average 5 million barrels per day and vary between 1 and 9 million barrels per day depending primarily on the demand for energy and supply and price of conventional oil and gas.

To achieve the President's goal of producing the equivalent in synthetic fuels of 1 million barrels of oil a day by 1985, the Task Force recommended a two-phased program. ERDA has referred to phase one as an information program. It is aimed at developing information on, and demonstrating the technical, economic, and environmental feasibility of commercial-scale plants using available technologies. Under phase one, it is intended that about 12 to 15 commercial-sized plants would be constructed and operated using different energy resources and synthetic fuel technologies. The equivalent in synthetic fuels of about 350,000 barrels of oil a day would be produced in phase one before 1985.

The major objectives of the phase one program are to

--investigate the environmental, economic, institutional, technical, and other production problems associated with synthetic fuel technologies,

--initiate development of an industrial base,

--supplement existing and planned domestic energy production, and

--improve this country's international position in energy matters.

The second phase of the program, if undertaken, would encourage the production of the equivalent in synthetic fuels of an additional 650,000 barrels of oil a day beyond the initial program. The Task Force decided, however, that a decision on the second phase would not be made until the 1978-79 time frame as more information becomes available on

--the environmental and other impacts associated with synthetic fuel technologies,

--results of ERDA's research and development aimed at improving such technologies,

--the world energy situation, and

--industries' response to phase one.

The Task Force intended that under phase one, the private sector--with Federal assistance--would construct and operate first-of-a-kind commercial-scale synthetic fuel plants. It recommended the following forms and extent of Government assistance to encourage industry to undertake the construction and operation of these plants.

Plant technology	Financial incentive	Operating incentive
High-Btu Gasification (Pipeline gas)	Loan guarantee of up to 75% of project cost	Not necessary if regulatory ruling permits cost of service recovery
Oil Shale or Utility/ Industry Fuels Conversion (Synthetic crude oil)	Loan guarantee of up to 50% of project cost	Competitively bid price guaranty
Utility/Industry Substitute Fuels --low-Btu gas, boiler fuels, etc. (Regulated industry)	Construction grant of up to 50% of project cost	None
Biomass Conversion (Gas/oil)	Loan guarantee of up to 75% of project cost	None

The Task Force, in arriving at the above recommendations, considered the advantages and disadvantages of various forms of Federal assistance for encouraging the construction and operation of a limited number of commercial-scale synthetic fuel plants. The forms of assistance included loans, loan guarantees, purchase agreements, price guarantees, construction grants, government ownership, corporate access to coal on public lands, and tax changes, such as investment tax credit, construction expensing and accelerated depreciation. Many of the considerations pertinent to its analysis were qualitative and thus involved judgment on the part of the Task Force.

The Task Force recommended the following authorization levels to implement the first phase of the synthetic fuels program.

Loan Guarantee	$ 6.0 billion
Price Guarantee	4.5 billion
Construction Grants	0.6 billion
Total Budgetary Authority	$11.1 billion

As shown below, the Task Force also devised a possible plant technology mix and production capacity for the program.

Type of plants	Probable number of plants	Estimated production capacity--each plant
High-Btu coal gasification	3	Each 40,000 bbl/day of oil equivalent
Oil Shale Conversion	2	Each 50,000 bbl/day of oil equivalent
Substitute Fuels Utility/Industrial Users	4	Each 25,000 bbl/day of oil equivalent
Biomass Conversion	5	Each 6,000 bbl/day of oil equivalent
Total	14	350,000 bbl/day of oil equivalent

ERDA DESIGNATED TO IMPLEMENT FIRST PHASE OF SYNTHETIC FUELS PROGRAM

The President designated ERDA to carry out the first phase of the synthetic fuels program. To carry out this responsibility, the Task Force recommended that ERDA establish a synthetic fuels program under a separate Assistant Administrator to be carried out in a financial commercial environment rather than in a research and development environment. Further, the Task Force recommended that, while ERDA has most of the basic statutory authority necessary to implement the program under the Federal Nonnuclear Energy Research and Development Act of 1974, the act should be amended to authorize ERDA to make loan guarantees under the program. ERDA is seeking legislation which would give it this additional authority.

On January 30, 1976, ERDA established the Office of Commercialization. One of the purposes of this office is analyzing and planning the synthetic fuels commercialization program.

The Director, Office of Commercialization, told us that the actual plant sizes, number of plants, and forms and levels of Government assistance recommended by the Task Force may vary somewhat depending on the proposals received from interested firms and final environmental impact statements. In this connection, we noted that ERDA plans to conduct additional studies to augment the Task Force report. These studies are aimed at undertaking strategy and policy analyses necessary for program implementation; initiating long lead-time activities related to program implementation (such as environmental impact statement finalization, program regulations); and informing the public, Congress, States, and other groups about the proposed program and respond to requests as needed.

We were told that the decision to implement the second phase of the commercialization program has slipped from the 1978-79 time frame until the the 1979-80 time frame.

STRATEGY FOR DEVELOPING TECHNOLOGIES

Processes for converting coal into gas and extracting oil from oil shale have been shown to be technically feasible. ERDA believes that the technologies for coal gasification and oil shale have advanced to the point where large size plants can be built to help demonstrate their economic and environmental viability in this country. Liquefaction technology has not advanced to this point.

Under the phase one program, ERDA currently envisions Government incentives to help industry build a limited number of synthetic fuel plants. Current projections show that the estimated equivalent price per barrel of oil for the plants' products is high compared to world oil prices. In this regard, we noted that a recent Congressional Budget Office report[1] states that production of synthetic fuels between 1975 and 1985 would probably be more costly than the purchase of the same quantity of imported fuel. It further states that unless world oil prices rise substantially above their current levels, the economic costs of synthetic fuel production would probably exceed quantifiable economic benefits which include the value of the fuels themselves and a degree of embargo protection. However, the report states that nonquantifiable and noneconomic considerations could tip the balance either way. For example, synthetic fuel production capability could provide insurance against large increases in

[1]Commercialization of Synthetic Fuels: Alternative Loan Guarantee and Price Support Programs - January 16, 1976.

world oil prices and might influence the Organization of Petroleum Exporting Countries to restrain price increases.

Although the plants will produce synthetic gas and oil, ERDA believes that the major contribution from these plants is the environmental and economic information that will be generated in locating and operating the plants. ERDA believes that this information would pave the way for industry and governmental regulatory bodies' involvement in the commercialization of a large number of coal gasification and oil shale plants. Appendix I presents a preliminary list of projects identified by ERDA which could possibly participate in phase one of the commercialization program.

Along with the phase one program, ERDA also intends to carry out research and development efforts to improve the existing coal gasification and oil shale technologies. This work is aimed at increasing the efficiency, environmental suitability, and improving the economics of existing technologies. To perform this, ERDA plans to spend about $600 million over the next 5 years.

The liquefaction process is considered by ERDA not to be commercially viable at this time and will not be included in phase one of ERDA's proposed commercialization program. ERDA plans to spend about $621 million on research and development on liquefaction processes over the next 5 years.

PROPOSED ENERGY INDEPENDENCE AUTHORITY

Legislation has been introduced in the Congress which would establish an Energy Independence Authority, a Government corporation with authority to provide financial assistance for those sectors of the economy which are important to the attainment of energy independence for the United States, and to change Federal Government operations to assist in the expediting of regulatory procedures which affect energy development.

The main purposes of the bill are to encourage the development of domestic energy sources and the conservation of energy, and to hasten the commercial operation of new energy technologies, with a goal of energy independence by 1985. The Authority will make loans or loan guarantees to private business concerns. However, the Authority is permitted to invest directly in energy-related enterprises and to guarantee prices.

On February 10, 1976, in response to Congressional requests, we commented on a bill (S. 2532, 94th Congress)

which, if enacted, would be cited as the Energy Independence Authority Act of 1975. Since the Authority conceivably would assume the financial responsibilities for the synthetic fuels program, our comments on that bill are included as appendix II. Among other things, our comments point to the need to insure that the bill provides an appropriate balance between energy conserving and energy supply technologies.

CHAPTER 3

ANALYSES OF PROPOSED LEGISLATION

The 94th Congress considered various legislative proposals providing for assistance to industry in building commercial synthetic fuel plants. One such proposal was contained in ERDA's authorization bill (H.R. 3474) for fiscal year 1976 and the transition quarter (July through September 30, 1976). This proposal would have amended the Federal Nonnuclear Energy Research and Development Act of 1974 (42 U.S.C. 5901) by adding section 17 to provide for loan guarantees for commercial demonstration facilities. This provision was not included in the ERDA authorization bill approved by Congress.

The proposal would have authorized ERDA to provide up to $6 billion in loan guarantees for

--the construction and start-up costs of commercial demonstration facilities for the production of synthetic fuel from coal, oil shale, biomass, and other domestic resources,

--the construction and start-up costs of commercial demonstration facilities for generating energy from solar, wind, geothermal, and other renewable resources,

--financing the purchase, construction, installation, and start-up costs of energy-efficient industrial equipment and facilities for commercial demonstration, and

--financing essential community development and planning which directly result from, or are necessitated by, one or more commercial demonstration facilities.

The purposes of this proposal were to insure adequate Federal support to foster a commercial demonstration program to produce synthetic fuels, and to gather information about the technological, economic, environmental, and social costs, benefits, and impacts of such commercial facilities. ERDA believes such legislation is needed to implement phase one of the synthetic fuels program.

AUTHORITY UNDER EXISTING LEGISLATION
TO PROVIDE GOVERNMENT ASSISTANCE
TO THE PRIVATE SECTOR

Under the Federal Nonnuclear Energy Research and Development Act and the Energy Reorganization Act of 1974 (42 U.S.C. 5801), ERDA has authority to provide various forms of Federal assistance for the research, development, and demonstration of synthetic fuel technologies. Such assistance can involve joint Federal/industry cooperative arrangements, contracts and grants for research and development, direct loans, price supports, and incentives in the form of financial awards to individuals for inventions.

Under existing law, a joint Federal/industry corporation may design, construct, and operate commercial-size facilities to ascertain the feasibility of a particular energy technology. However, we believe ERDA has no authority for granting loan guarantees under either a research, development, and demonstration program, or a commercial program. Further, our survey of existing law has provided no indication that ERDA has present authority to make construction grants.

The Federal Nonnuclear Energy Research and Development Act provides explicit authority for price supports--subject to certain conditions including congressional authorization of each price-support program--for full-scale, commercial-size facilities and for direct loans to non-Federal entities conducting demonstrations of new technologies. Nothing in the act indicates that such assistance could not be applied to a "commercial demonstration program." Inasmuch as Federal participation in demonstration projects is authorized to include "***demonstrations of prototype commercial applications for the exploration, development, production, transportation, conversion, and utilization of energy resources", the language of the act may well be broad enough to so assist a commercial demonstration program.

However, we note that the conference report on H.R. 3474 contained the following language:

> "The Conferees especially emphasize that the approval of Section 103 in no way constitutes an expression of approval of approaches for assistance beyond loan guarantees. Nothing in Section 103 authorizes construction grants, price supports or price guarantees for the production from demonstration projects***" (H.R. Rep. 94-696, 94th Congress, 1st Session, 68 (1975))

Area of concern

Although section 103 was not adopted, the most recent expression on this matter is at variance with the above language of the Federal Nonnuclear Energy Research and Development Act. ERDA believes that other forms of Federal assistance--price support, direct loans, or incentives other than loan guarantees--are essential to carry out phase one of the synthetic fuel commercialization program. In light of the language of the conference report, we believe that ERDA should fully justify the need for such assistance so that Congress may consider such measures as part of the total funding authorization needed to implement phase one.

PLANT MIX FOR ERDA'S INFORMATION PROGRAM

Section 103 of H.R. 3474 would have provided authorization of $6 billion for a loan guarantee program, provided that up to $2.5 billion of guarantees would be available for commercial demonstration facilities to produce high-Btu gaseous fuels compatible for mixture and transportation with natural gas by pipeline.

The plant mix, number and cost estimates, including the community assistance anticipated by the Task Force are shown below.

Synthetic Fuels Program

Plant type	Number scheduled	Estimated cost of plants (millions)	Loan guarantee (millions)
High-Btu Gas	3	$2,700	$2,000
Shale Oil	2	2,100	1,050
Industry Fuels	2	1,300	650
Utility Fuels	2	1,000	a/
Biomass	5	1,200	900
Community Assistance			350
Contingency			1,050 b/
Total Budget Authorization Request			$6,000

a/ Construction grants of $500 million are anticipated for utility fuels, which would not be part of the loan guarantee program authorization request.

b/ The contingency amount provides for construction delays, extraordinary inflation, different plant mixes, increased incentives, etc.

As shown above, three high-Btu gasification plants--all using the same process--were included in the Task Force's commercialization program. The Director of the Office of Commercialization informed us that two plants were originally chosen because two different types of western coal will be used resulting in different data; one plant will use lignite coal and one will use sub-bituminous. The Task Force had planned to include a liquefaction plant in the commercialization program. However, the Director of the Office of Commercialization informed us that this plant was later dropped from the program because it was felt that a liquefaction plant using existing technology could not be made commercially viable. This official informed us that the third high-Btu gasification plant--which will also use either lignite or sub-bituminous coal--was then added in place of the liquefaction plant. He could not provide us with any definitive justification for the Task Force's inclusion of this plant.

The Task Force included two oil shale plants and four utility/industry plants in its commercialization program. The Director, Office of Commercialization, informed us that each plant would use a different process or result in a different fuel type. ERDA plans, however, under its proposed commercialization program, to determine the optimum technology and plant mix by July 1976.

We also noted that section 103 of H.R. 3474 would have provided for

> "***financing the construction and start-up costs of commercial demonstration facilities to generate desirable forms of energy (including synthetic fuels) in commercial quantities from direct solar, wind, ocean thermal gradient, bioconversion, or other renewable energy resources."

In this regard, the Director of the Office of Commercialization informed us that although not specifically mentioned in the Task Force report, ERDA plans to either use a portion of the $1 billion contingency (see p. 13) or request additional authorities from the Congress to commercialize non-synthetic fuel technologies.

Area of concern

In our view, in support of any legislation authorizing loan guarantees for commercial synthetic fuel facilities, ERDA should fully justify the type and number of plants it will need to accomplish the objectives of the first-phase

program. In addition, because of the high cost of these plants, we believe ERDA should specifically justify the need for more than two high-Btu gasification plants and its plans and funding requirements to commercialize the other forms of energy identified in section 103.

DEFAULT PROVISION

Section 103 of H.R. 3474 would have provided that in case of default, the holder of a guaranteed obligation could have demanded payment of the unpaid amount from the Government. We find nothing objectionable in this provision since the Administrator has sufficient flexibility in protecting the Government's interest through appropriate agreements for specifying any rights and obligations.

REVOLVING FUND

Section 103 would have authorized the establishment of a revolving fund for carrying out the program authorized in the bill. An ERDA official informed us that the procedures for operating the revolving fund will be developed by the Treasury Department and ERDA after legislation is enacted.

Area of concern

We believe that, to maintain congressional control, proposed legislation to authorize program financing by means other than through the appropriation process should include provisions for annual review by the Congress, coupled with such limitations and allowances for flexibility as deemed appropriate. We noted that section 103 did not specifically require an annual report to the Congress on the activities of the revolving fund.

We feel it important that legislation giving an agency authority to establish a revolving fund should provide for annual reporting by the agency to the Congress on the activities of its revolving fund.

FINANCING INDUSTRIAL FACILITIES AND EQUIPMENT

Section 103 would have provided that loan guarantees could have been used for financing the purchase, construction, installation, and start-up of energy-efficient industrial equipment and facilities for commercial demonstration.

It appears that this section could establish authority for ERDA to provide loan guarantees to those industries manufacturing component parts for synthetic fuel plants.

According to ERDA officials, it is not their intention to provide loan guarantees to component manufacturers involved in synthetic fuel projects.

Area of concern

In our view, any legislation containing a similar provision should clearly define whether those industries manufacturing component parts would be eligible for a loan guarantee program.

HOLDER VERSUS LENDER

Section 103 of H.R. 3474 would have provided that no guarantee under this section could have been terminated, canceled, or otherwise revoked and would be incontestable in the hands of the holder except as to fraud or material misrepresentation on the part of the holder. We find nothing objectionable in this provision. Our comments follow.

In the past, other legislative proposals contained language similar to the above provision but differed in that they provided for incontestability

> "except for fraud or material misrepresentation on the part of the lender."

In order for the Government to insure a market for the obligations guaranteed, potential buyers must have assurance of collecting on the guarantees. An arrangement to make the obligations contestable where the lender committed fraud or misrepresentation would certainly have the practical effect of negating the market of potential purchasers. Traditional practice has been to protect these subsequent purchasers against all but their own fraud or misrepresentation.

In any event, it is not inconsistent with the best interest of the Government to pay innocent holders of guaranteed loan notes upon default of the borrower, even where there was fraud or misrepresentation by the original lender, since payment would not waive any rights of the Government against the fraudulent lender.

Therefore we feel that, consistent with traditional and sound practice in this area, similar legislation for commercial demonstration of synthetic fuel plants should retain the phrase "of the holder."

CHAPTER 4

CONCLUSIONS

Under phase one of a possible two phase program, ERDA plans to aid industry in building a limited number of commercial-scale synthetic fuel plants using technologies which have advanced to the point where large scale plants can be built to help demonstrate their economic and environmental viability in this country.

ERDA recognizes that these plants, using currently available processes, are limited from an economic and environmental standpoint. However, ERDA believes that the major contribution from these plants will be the environmental and economic information that will be generated in locating and operating them. ERDA believes this information would pave the way for industry and governmental regulatory bodies' involvement in the commercialization of a large number of coal gasification and oil shale plants.

Along with phase one, ERDA would also be performing research and development to bring down the costs and enhance the environmental suitability of these plants. Because of refinements which could be made to existing technologies, we believe close scrutiny should be given to the number and size of plants proposed by ERDA if phase one is authorized. Similarly, if phase one is authorized, close scrutiny should also be given to the information obtained under this phase before authorizing the possible second phase of the synthetic fuels program.

In anticipation of legislation authorizing phase one, ERDA plans to make various studies which it expects to complete by July 1976. These studies will augment the Task Force report and will be aimed at undertaking strategy and policy analyses necessary for program implementation; initiating long lead-time activities related to program implementation (such as environmental impact statement finalization, program regulations); and informing the public, Congress, States, and other groups about the proposed program and respond to requests as needed.

Given the objectives of these studies, we believe the Congress should consider awaiting their completion before considering legislation authorizing a commercial demonstration program. These studies should provide the Congress with better information for determining whether, and to what

extent, Federal assistance should be authorized to carry out phase one of the program.

In this regard, Congress should consider specifically requiring ERDA to delineate and justify the scope and magnitude of Federal assistance it feels will be needed to carry out phase one and to justify the type and number of plants it will need to accomplish the objectives of phase one.

Legislation is currently before the Congress which would establish an Energy Independence Authority. The question of Government assistance for encouraging the commercialization of synthetic fuel technologies, and nonsynthetic fuel technologies, could possibly be resolved within the broader scope of the Authority proposal, which covers all forms of energy supply, rather than a select few.

While we have expressed our concern in commenting on the Authority proposal over the lack of balance between energy supply and energy conserving technologies, we do believe it offers a desirable option for dealing on a broad basis with the question of the proper Government support role for commercialization of energy technologies. The alternative, of course, is piecemeal consideration of Government support for individual energy technologies such as synthetic fuels.

In this regard, there are important, but unclear, implications in giving industry Federal assistance to help demonstrate the commercial viability of synthetic fuel technologies. Such implications involve this country's future policy in the area of price supports, the various supply outputs, and also indirectly the need for a price floor over oil and gas, both domestic and imported.

The Task Force considered the advantages and disadvantages of various forms of Federal assistance for encouraging the construction and operation of commercial-scale synthetic fuel plants. These included: loans, loan guarantees, purchase agreements, price guarantees, construction grants, government ownership, corporate access to coal on public lands, and tax changes.

Because of time constraints, we did not evaluate the pros and cons of the various alternatives considered by the Task Force. Accordingly, we are not in a position to comment on the appropriateness of the alternatives recommended by the Task Force. It should be noted, however, that in several instances, the considerations used by the Task Force were judgmental in nature. A different emphasis on considerations --such as impact on the budget, degree to which the alternative preserves and enhances competition, ability to achieve

program goals, and extent of Federal involvement in management of operations--could conceivably lead to a different choice of alternative forms of assistance.

APPENDIX I

LIST OF CANDIDATE PROJECTS IDENTIFIED BY ERDA

Technology	Project	Sponsor
High-Btu Gasification	ANG Coal Gasification	ANG Coal Gasification Company
	Dunn Center	Natural Gas Pipeline Company of America
	El Paso Natural Gas (Burnham)	El Paso Natural Gas Company
	Panhandle Eastern	Panhandle Eastern Pipeline Company
	WESCO	Texas Eastern Transmission Company and Pacific Lighting Corporation
Low-Btu Gasification	Columbia Coal Gasification Corporation	Columbia Coal Gasification Corporation
	Consolidated Natural Gas	Consolidated Natural Gas Company
	Consumers Power	Consumers Power
	LAMPCO	Louisiana Municipal Power Commission
	UGI Corporation	UGI Corporation
	Wheelabrator-Frye	Wheelabrator-Frye Incorporated
Oil Shale	Colony Development	Atlantic Richfield Company, the Oil Shale Corporation, Shell Oil Company, and Ashland Oil Incorporated
	Occidental Petroleum	Occidental Oil Shale, Incorporated

APPENDIX I

Technology	Project	Sponsor
Oil Shale (continued)	Rio Blanco	Gulf Oil Company and Standard Oil of Indiana
	Superior Oil	Superior Oil Company
	TOSCO Sand Wash	The Oil Shale Corporation
	Tract C-B	Ashland Oil Incorporated and Shell Oil Company

APPENDIX II

GAO COMMENTS ON S. 2532 94TH CONGRESS

The bill would establish the Energy Independence Authority (EIA), a Government Corporation with authority to provide financial assistance for those sectors of the economy which are important to the attainment of energy independence for the United States, and would change Federal Government operations so as to assist in the expediting of regulatory procedures which affect energy development.

The main purposes of the bill, as stated in section 102, are to encourage the development of domestic energy sources or the conservation of energy, and to hasten the commercial operation of new energy technologies, with a goal of energy independence by 1985. Section 302 provides that, to the extent practicable, the form of the encouragement will be EIA loans or loan guarantees to private business concerns. However, the EIA is permitted to invest directly in energy-related enterprises and to guarantee prices. Only grants-in-aid are specifically precluded. (Sec. 301)

The bill authorizes an appropriation of $25 billion to the Treasury for the purchase of EIA capital stock. (Sec. 401) In addition, the EIA is authorized to borrow and incur obligations totalling $75 billion. (Sec. 402(a)) The aggregate amount of $100 billion is fixed as the upper limit of the EIA's actual and potential liability stemming from direct investment, loans, and guarantees of loans and prices. (Sec. 307)

Our central concern with this bill lies in its lack of balance. The goal of energy independence can be furthered by increases in domestic supply, by reductions in domestic consumption, or a combination of both. This allows a larger fraction of our total energy use to be satisfied out of indigenous supplies. This bill exhibits a clear preference for initiatives of the supply-increasing variety and pays little attention to energy conservation. It states that conservation is among its purposes (sec. 102(b)), but its basic supply orientation is evident from the kinds of projects for which EIA financial assistance would be available. In the listing of eligible projects under subsection 303(b), only the first item mentions conservation and that category of energy projects is limited to those that "are not in widespread domestic commercial use." This last proviso would appear to preclude, for example, assistance to a utility-administered residential insulation project, since home insulation is widespread. No equivalent condition is

attached to the supply-increasing projects listed, such as those designed to stimulate coal or nuclear power generation.

We believe that many initiatives in the direction of conservation hold the promise of moving the country farther down the road toward energy independence per dollar spent than do most supply increasing options. Still, we recognize the merit of putting momentum behind utilization of domestic energy supplies, especially for the longer term. Accordingly, we believe a bill with the ambition of attaining energy independence ought, at least, to be even handed in its treatment and offer as express and unrestricted financial assistance to conservation efforts as it does to supply efforts.

In this connection we note that the bill is not neutral on conservation options. Actually, it would hamper conservation efforts rather than simply fail to promote them. This is true because the bill would result in allocation, not creation, of capital. The EIA's loan funds would, in large part, be raised in the private capital market. Its guarantees would make projects it assists financially more attractive to private capital than conservation projects not backed by Federal guarantees. Thus, both its loans and its guarantees will siphon private capital away from those conservation projects which might have been able to obtain private financing in the absence of EIA operations.

The choice of projects to receive financial assistance, and the form of assistance, ought to be based upon reasonable forecasts of the degree to which each project will advance the goal of independence per dollar of assistance accorded it. We believe the bill should contain specific criteria for evaluating the relative merits of claims for financial assistance whether the initiatives are within either the conservation or supply category. An example of the kind of approach we are suggesting is the method for evaluating conservation techniques developed by the Office of Energy Conservation and Environment, Federal Energy Administration. Stated broadly, this approach divides the dollar investment required to obtain increased energy efficiency in a particular application by the barrel equivalents which would be saved thereby, arriving at a dollar per barrel figure which represents the real value of the initiative. Such figures for different conservation techniques can be readily compared with each other and with cost figures for supply-increasing options.

It is also important for the criteria established by the bill to recognize and prefer those projects with energy

gains which multiply themselves in a wider economic sector. For example, an energy saving in the manufacture of a particular paper product which causes it to become economically more attractive than some energy intensive plastic will multiply the original saving, if there is substitution of the paper for the plastic.

A second primary concern is that the bill would create a Government corporation to undertake its stated purposes. Our Office has consistently taken the position that the public interest is best served when congressional control over activities is exercised through annual reviews and affirmative action on planned programs and financing requirements which attend the appropriation processes, and through the application of statutes and regulations which usually govern the operations of Government agencies. We believe that departures from the standard should be permitted only on a clear showing that an activity which is susceptible of operation through a new regular Government agency or through an expansion of similar programs in existing Government agencies cannot be successfully operated in the public interest within that framework.

In this regard, we note that the Energy Research and Development Administration (ERDA) is not mentioned in the bill, although ERDA already has extensive responsibilities to plan, program, and assist funding of demonstration energy projects and technologies under sections 4 through 7 of the Federal Nonnuclear Energy Research and Development Act of 1974, approved December 31, 1974, Pub. L. No. 93-577, 88 Stat. 1878, 1880, 42 U.S.C.A. §§ 5903-5906 (Pamphlet No. 1 Feb. 1975). The authorized forms of Federal assistance therein include: (1) joint Federal-industry experimental, demonstration, or commercial corporations; (2) Federal purchases or guaranteed price of the products of demonstration plants; and (3) Federal loans to non-Federal entities conducting demonstrations of new technologies. In addition, the report entitled "Recommendations for a Synthetic Fuels Commercialization Program," submitted by the Synfuels Interagency Task Force to the President's Energy Resources Council in June 1975, would place ERDA in the role of promoting commercial synthetic fuel plants. Moreover, we note that H.R. 10559, 94th Congress, which would authorize loan guarantees for the construction and operation of commercial demonstration facilities for the conversion of domestic coal and oil shale into synthetic fuels and for the construction and operation of facilities generating energy from renewable sources, would be administered by ERDA. In view of this potential duplication between ERDA and the

proposed Energy Independence Authority, we believe that S. 2532 should specifically address its intended effects on ERDA.

Nevertheless, if a corporation is considered best suited as the mechanism for achieving the purposes of the bill, we suggest that the corporation be made subject to the provisions of the Government Corporation Control Act, 31 U.S.C. § 841 et seq. (1970). Subsection 804(e) of the bill presently exempts EIA from coverage by the Government Corporation Control Act. We are particularly concerned that EIA would not be subject to the budgetary review process contemplated by sections 102, 103, and 104 of the Government Corporation Control Act, 31 U.S.C. §§ 847-849 (1970).

The bill is underlaid by some assumptions regarding national policy which are by no means settled. Its predilection toward nuclear power generation is the most obvious example. Another is seen in its willingness to give the Government a large quasi-commercial interest in energy supplies which would be in competition with imported crude oil. Since the bill does nothing to limit imports directly, the underlying assumption appears to be that world crude prices will stay high enough to insure the profitability of the EIA's investments in alternative domestic supplies. Thus, the Government would have a financial interest in keeping world crude prices up when, in the opinion of many, the interest of the United States would be best served by an opposite policy.

In addition, we question the amount of the financial assistance this bill envisions. Depending on the extent to which conservation options are made eligible for assistance and on the treatment of supply options, the overall assistance could reasonably be smaller or considerably larger. Comprehensive cost and economic analyses are called for on this matter.

Notwithstanding these problems, the bill does exhibit an important recognition that unmodified market forces will be insufficient to achieve the goal of energy independence, however defined. Therefore, in commenting further we accept the basic premises of the bill and make some suggestions with respect to particular provisions.

As is indicated in subsection 101(d), an objective of the bill is to provide "additional" capital for energy projects, and it would not be in the national interest for energy projects to be financed by the Federal Government if they otherwise might receive private financing. However, the

bill is vague in its requirements and does not adequately insure that the projects eligible for assistance would not otherwise be built with private financing. The specific financial eligibility criterion established by subsection 303(a) is that the project "would not receive sufficient financing upon commercially reasonable terms from other sources to make the project commercially feasible." Subsection 303(b) describes five types of eligible projects. Subsection 303(b)(1) limits assistance to those energy technologies or processes not in widespread commercial use, and subsection 304(b) further limits eligibility to projects that are beyond the research and development phase. Some clarification would be helpful in the latter two subsections to better define "widespread commercial use" and better delineate when "research and development" ends and "commercialization" begins.

In addition, it is apparent from subsection 303(b) that electric utilities could receive significant amounts of assistance, since two of the five categories of eligible projects apply almost exclusively to utilities. We suggest that section 303 be revised to limit Federal assistance to electric utilities in only those specific instances where a utility would propose to employ a promising, innovative energy technology or process not currently in widespread commercial use, but could not, without Federal assistance, justify the additional cost or increased risk. The Federal Government would thus assume the risk from specific utilities employing unproven energy processes or technologies. Hopefully these new technologies will become proven as experience is gained in their application and widespread commercialization will occur, resulting in more effective use of the Nation's energy resources and reduced foreign dependence.

Subsection 304(c) requires that before any State or locally regulated firm (such as an electric or natural gas utility) could receive financial support, the regulatory body would be required to certify the need for the project and sign an agreement stating that it would allow, without public hearings, quarterly utility rate increases adequate to maintain a revenue requirement as determined by the Authority. This subsection appears to require State regulatory commissions to abdicate part of their responsibility of determining the revenue requirements of the utilities they regulate.

Section 307 limits the Authority's total financial assistance to the sum of its authorized borrowing. A more practical limit would be one based on paid-in capital, actual borrowings, and accumulated earnings or deficits.

Section 308 states that the EIA may not provide any financial assitance or make any further commitments for financial assistance if, after audit, it is required under generally accepted accounting principles to establish reserves. We believe that the words "after audit" on page 19, line 19, should be deleted since generally accepted accounting principles would dictate establishment of the types of reserves mentioned here.

In view of the formula for automatic reduction of authorized borrowing and authorized capital stock as contained in subsection 311(a) and the limitation on the amount of financial assistance contained in section 307, the reserves required by section 308 must be based on the outstanding capital stock and the net gains realized upon dispositions, which have not been previously applied to retirement of the EIA's obligations and capital stock. Accordingly, section 308, lines 1 to 7 on page 20 of the bill, should read:

> "capital stock outstanding, (ii) its earned surplus, and (iii) net gains realized upon dispositions described in section 311 (which have not been previously applied to retirement of the Authority's obligations and capital stock), all of which shall be determined in accordance with generally accepted accounting principles."

Use of the phrase "in consideration for the extension of financial assistance" in subsection 311(a) raises the question whether the securities or assets acquired are (1) payment for extending financial assistance (such as points paid for mortgage loans), (2) collateral for loans made and/or guaranteed by EIA, (3) investment (bonds, notes, etc.) by EIA, or (4) any combination of the above. If the assets are acquired as collateral, EIA would obtain ownership only in the event of default, and its right to sell them outright may be limited accordingly.

The provision in section 401 (page 24, lines 21-25, and continued on page 25, lines 1 and 2) is not clear as to whether interest on deferred dividends is to be computed on the basis of compounded interest or simple interest (using the interest rate in effect at the beginning of each year).

Subsection 501(b) states that "Directors of the Authority, whether serving full time or part time, shall be compensated at an annual or daily rate to be determined by the President." Further, subsection 502(a) states that "The President shall fix the compensation of the Chairman of

the Board." These provisons would affect a total of six positions. We do not favor the setting of salaries in this manner and are not aware of any existing provision in law granting the President authority to fix pay without any restrictions. Generally, limits are placed on executive branch authority to fix pay which preserves internal alignment relative to the nighest General Schedule grade or executive level positions. We would suggest the addition of specific language regarding compensation to be paid officers or employees; for example, "at a rate not to exceed level 1 of the executive schedule."

Section 503 makes the provisions of chapter 11 of title 18, United States Code, concerning conflicts of interest, applicable to the directors and all officers and employees of the Authority. The Board of Directors are also authorized to promulgate regulations thereunder. We believe greater protection against conflicts of interest would be provided if the bill were amended to include the following prohibitions:

> "The directors, officers, and employees of the Authority, and members of their immediate family, shall not own any interest in any business concern to which financial assistance is provided under this act."

We also believe that the Board of Directors should be required to promulgate conflict of interest regulations, rather than be merely authorized to do so.

Subsection 505(c) of the bill authorizes the General Accounting Office to conduct audits of the accounts of the EIA. In lieu of the language contained therein which is applicable to GAO, we would suggest the following:

> "The Comptroller General shall audit the programs, activities, and financial operations of the Authority for any period during which Federal funds are available to finance any portion of its operations and shall report to the Congress at such times and to such extent as he deems necessary to keep the Congress informed on the status of such programs, activities, and operations, and to make recommendations for achieving greater economy, efficiency and effectiveness. The audit shall be made under such rules and regulations as he may prescribe.

"For the purpose of such audits, the Comptroller General, or any of his duly authorized representatives, shall have access to and the right to examine all books, accounts, records, reports, files, and all other papers, things or property belonging to or in use by the Authority."

In conclusion, we are generally concerned that the bill seems to treat a number of established, statutory policies as obstacles to be overridden or avoided in pursuit of its goals. As a general matter, we believe it is wiser for new legislation to consider existing policies on their own merits and either modify them as required by new circumstances or follow them if they remain valid. Examples of such troublesome provisions are: (1) the provision in subsection 804(b) which excludes EIA from the definition of "agency" within the meaning of the Administrative Procedure Act, 5 U.S.C. § 501 (1970), which, as one consequence, exempts EIA entirely from the provisions of the Freedom of Information Act, 5 U.S.C. § 502 (1970); and (2) the provision in subsection 804(c) exempting EIA from all Federal laws relating to public contracts and public buildings and works. In addition, the impact of subsection 804(a)(ii), relating to the filing of environmental impact statements pursuant to subsection 102(2)(C) of the National Environmental Policy Act of 1969, as amended, 42 U.S.C. § 4332(2)(C) (1970), is not clear.