

CHAPTER I INTRODUCTION

A. BACKGROUND

In his State-of-the-Union Message, the President called for accelerated development of our energy technology and resources and proposed a set of comprehensive energy supply and conservation measures to reduce the U.S. requirements for imports of foreign oil to approximately 4 million barrels per day by 1985. As an important element of this 1985 program, the President proposed a National Synthetic Fuels Commercialization Program with a goal to develop production of an equivalent of 1 million barrels per day of synthetic fuels by 1985. Such a program, in which the Federal Government would provide suitable financial or other incentives, would stimulate investment in a number of commercial-scale plants to convert coal, oil shale and other domestic energy resources into clean liquid and gaseous fuels. This volume summarizes the results of evaluating a broad range of options and includes recommendations concerning the nature and scope of the recommended program.

B. SYNTHETIC FUELS AS A MAJOR U.S. ENERGY OPTION

Although petroleum and natural gas now account for over 75 percent of current U.S. energy consumption, they represent less than 8 percent of all domestic fossil fuel reserves. The majority of domestic fossil fuel energy reserves are contained in coal and oil shale as illustrated in Table 1.

When compared with current consumption of fossil fuels in the U.S., which at present accounts for 95 percent of all energy produced domestically, proven reserves of coal and oil shale could provide over 100 years of supplies at current consumption rates.

TABLE 1. DOMESTIC FOSSIL ENERGY CONSUMPTION AND SUPPLY*
(QUADS OR 10¹⁵ B. T. U.)

Fossil Fuel Source	Consumption 1974	Reserves**	Recoverable Resources**
Coal	13.0	5,200 - 10,400	12,000 - 33,000
Oil (inc. Nat. Gas Liq.)	33.8	250 - 410	800 - 1,100
Gas	22.3	230 - 430	775 - 1,100
Shale (25 gal/ton)	0.0	460 - 1,160	1,200 - 2,300
Total (Fossil)	69.1	6,150 - 12,390	14,775 - 37,500
All Other	4.1		
Total	73.2		

*Estimates from U.S.G.S. June, 1975.

**Entries correspond to full energy content of resource and do not take account of efficiencies of utilization.

Thus, domestic resources of oil shale and coal are vast and are currently not being substantially used compared with more limited, although presently more economic, domestic oil and gas resources. The key issue regarding the need for and extent of a Synthetic Fuels Commercialization Program is whether the investment climate will be such as to require Federal stimulus at the time when initiating a synthetic fuels industry becomes necessary.

C. BENEFITS IN ACCELERATING SYNTHETIC FUELS

In considering a program to accelerate the introduction of commercial-scale synthetic fuels technology, there are a number of potential benefits:

- To ensure early development of information and industry infrastructure needed prior to possible major expansion of synthetic fuels production capacity by:
 - investigating environmental, economic, institutional, regulatory, technical and other factors associated with large-scale synthetic fuel plant operations; and
 - promoting accumulation of experience by the private sector in synthetic fuels production and utilization.

- To increase domestic energy production in the mid-term by supplementing existing and planned domestic energy production in 1985 and thereby:
 - reducing reliance on imports and thus providing additional insurance against an embargo; and
 - providing less expensive supplies in the event world oil prices continue to rise.

- To improve U.S. international position in energy matters by:
 - demonstrating to the oil exporting nations a U.S. capability to develop its vast coal and oil shale resources.
 - establishing U.S. leadership among consuming nations in international efforts to become less dependent on Middle East energy supplies.

D. POSSIBLE COSTS IN ACCELERATING SYNTHETIC FUELS COMMERCIALIZATION

There are a number of potential costs which have been evaluated in considering the alternatives for a synthetic fuels program. These include:

- Costs to the Nation of subsidizing synthetic fuels which could replace other energy that might be produced less expensively (e.g., imported oil, Alaska, OCS, etc.).
- Environmental and socio-economic costs associated with accelerated development of shale and coal resources above that which would otherwise take place.
- Opportunity costs that could result from diverting labor, capital and materials from other "high priority" national endeavors including other energy projects.
- Cost associated with premature commitment to large-scale introduction of inefficient "first-generation" technologies.

E. OTHER FACTORS CONSIDERED IN EVALUATING PROGRAM ALTERNATIVES

In considering the appropriate nature and extent of Federal involvement in Synthetic Fuels Commercialization, it is desirable to ensure that any program:

- Have minimal impact on other energy markets so as not to disrupt seriously or retard other domestic energy production activities.
- Minimize subsidization of synthetic fuels projects that would proceed without government assistance.
- Limit long-run government financial commitments and minimize overall cost to the taxpayer.
- Minimize government involvement so as to:
 - provide maximum experience in synthetic fuels operations to the private sector; and
 - limit creation of a large government bureaucracy with attendant administrative complexities.
- Compliment ERDA's R&D program by providing a link between development and full-scale commercial operations.
- Include a broad enough range of fuel types, resources and technological approaches to accumulate adequate information on future synthetic development.
- Maintain the flexibility to alter the program as a result of changes in relative attractiveness of synthetic fuels either as compared with natural fuels or among synthetic fuel types.
- Provide credible checkpoints for review of environmental and social impacts of early plants before committing to massive industry development.
- Be publicly acceptable and legislatively feasible in its implementation.

F. OBJECTIVES AND SCOPE OF SYNFUELS PROGRAM DEVELOPMENT EFFORT

At the time of the announcement of the Synthetic Fuels Program in the President's State-of-the-Union Message, there had been

only preliminary analysis of the detailed scope of the program, its time phasing, and the types and costs of incentives that might be provided. Thus, an interagency task force under the direction of the Office of Management and Budget with the participation of the Energy Research and Development Administration, the Federal Energy Administration, Department of the Interior, and a number of other Federal agencies, was initiated during February 1975¹. The principal objectives of this interagency task force effort were:

- To evaluate the overall economic and environmental costs and benefits of alternative-size synthetic fuels programs and recommend a program-level option.
- To formulate a detailed incentive program plan for each fuel/resource type (e.g., liquids from oil shale) and to recommend an overall set of incentives.
- To develop measures needed for expeditious program implementation including required legislation, financing mechanisms, and others, as needed.

In developing the recommendations summarized in this overview report, the task force conducted four major interrelated analyses:

- The first major analysis, the results of which are contained in Volume II of this report, involved the evaluation of the overall cost and benefits to the Nation of alternative-size programs. This effort considered such factors as possible costs to the Nation in subsidizing synthetic fuels, opportunity cost in undertaking the program, environmental and social cost, the effects on the economy including inflation, effects on income distribution, and a range of benefits including the acquisition of early information on environmental and economic factors, enhanced energy security, protection against embargoes, incremental energy supplies, and other direct and indirect economic benefits.
- The second effort, which is described in detail in Volume III of this series, involved developing detailed incentive program plans in each of five fuel/resource areas (i.e., oil shale, high Btu gas, electric utility fuels, synthetic crude and conversion of

¹ The organization of the Task Force and its membership is described in Appendix A.

organic wastes) to ensure several alternative production levels of synthetic fuels by 1985. This effort examined a range of financial incentives including loans, loan guarantees, price supports, purchase agreements, construction grants, and others as well as non-financial incentives such as availability of land, changes in regulations and removal of certain disincentives. Each of the potentially attractive incentives was analyzed for each of the five major fuel resource types. The incentives were compared, not only with respect to their effectiveness in attracting industry participation, but also the degree to which they would promote competitiveness, the extent to which they would require government involvement as well as a number of other factors. Finally, direct costs to the government of the alternative programs were estimated. Foregone taxes were also considered but have a minimal effect on the selected incentives.

- The third major part of the program development activity, which is documented in Volume IV of this series, involved a comprehensive analysis of environmental and other impacts associated with various possible synthetic fuel program configurations. This analysis has identified and determined the effects of various potential programs on air and water quality, land use, solid waste disposal, social impact and on a range of other factors that would be considered in a final decision concerning program implementation.
- The fourth major effort, described in Chapters VIII, IX and X of this volume, involved an examination of alternatives in implementing a program including organizational options. This activity has focused on identifying additional authority needed to implement the recommended incentive programs, amendments needed to various statutes, the need for an environmental control strategy, the need for impact assistance, and a range of questions regarding methods of financing the program. This effort has resulted in specific organizational and legislative recommendations needed for completing the program.

G. ORGANIZATION OF THE OVERVIEW REPORT

Chapter II of this volume describes the near-term energy outlook and discusses the impact of the President's energy program. Chapter III provides projections of the long-range energy outlook and examines the need for synthetic fuels under various assumptions. Chapter IV summarizes recent industry experience in synthetic fuels development, current industry plans, and the cost of producing synthetic fuels. Chapters V and VI

describe the results of the cost benefit analysis including consideration of environmental and other impacts of each alternative program level. Chapter VII establishes the alternative program target levels, summarizes the evaluation of candidate incentive programs, and presents estimates of the cost of the alternatives to the government. Chapter VIII provides details of the recommended program including information on incentives, environmental protection strategy and impact assistance. Chapter IX addresses organizational options for implementing the recommended program and Chapter X outlines required legislative authorities and regulatory approvals needed for program execution.

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