

**STATEMENT OF RAYMOND C. SCHEPPACH
ASSISTANT DIRECTOR
NATURAL RESOURCES AND COMMERCE DIVISION
CONGRESSIONAL BUDGET OFFICE**

**Before the
Governmental Affairs Committee
United States Senate**

July 20, 1979

Mr. Chairman, I am pleased to appear before this Committee to discuss the development of a synthetic fuel industry in the United States. In my remarks, I will address four major issues:

- o The costs and benefits of developing a domestic capacity to produce synthetic fuels;
- o The appropriate production goal for synthetic fuels;
- o The advantages and disadvantages of alternative financing mechanisms.
- o Technical issues regarding fuel type and mix of resources and technologies.

Benefits and Costs

Benefits. The benefits attributable to synthetic fuel production are essentially the same as those of any program intended to reduce oil imports. First, it would provide protection against future shortages or interruptions in the supply of oil. As both the current and the 1973-1974 experience indicate, oil shortages do have a negative effect on the economy and, in extreme cases, could even affect national security. Second, synthetic fuel production might reduce the rate of future OPEC price increases. This would improve the U.S. balance-of-payments position and would provide some relief from inflationary pressures. Finally, a unique advantage of

synthetic fuel production is that it would provide information about the feasibility and costs of alternative technologies that would be helpful in designing our long-term transition to alternative energy resources.

Costs. Synthetic fuel production involves two potential costs. First, it would likely cause additional environmental degradation, especially from intensive surface mining. Second, synthetic fuels will probably be more expensive than conventional fuels, at least in the intermediate term, and thus they will likely entail higher consumer prices or government subsidies. It must be stressed, however, that there is great uncertainty about the future price of synthetic fuels relative to conventional oil. The price of conventional oil is determined largely by a cartel and reflects political as well as economic factors; the price of synfuels, on the other hand, will depend on scale economies, environmental and technological unknowns, and the effects of future inflation on the construction of large plants. Consequently, if a synthetic fuel program is developed, it should be viewed as insurance against future supply shortages and OPEC price increases, and not necessarily as an economically efficient investment.

Appropriate Production Goals

Most of the synthetic fuels bills that are under active consideration by the Congress have production goals between 500,000 and 5 million barrels a

day for various points in time between 1985 and 1990. These goals, however, need to be considered relative to time constraints and alternative ways to reduce oil imports.

With respect to construction time, synthetic fuel plants can be compared with new nuclear power plants because both have high costs and similar siting and environmental concerns. At present, nuclear power plants are taking over 11 years to bring on-line. Even under accelerated siting procedures, it will most likely take a minimum of 8 years to bring into production commercial-scale synthetic fuel plants that produce the equivalent of 50,000 barrels of oil per day, which is the size needed to achieve the appropriate economies of scale.

With respect to the level of production, it should be noted that a certain threshold is necessary in order to develop the critical technical, environmental, and economic information that is required to choose the most efficient technologies and resources that should be developed over the long run; any goal above that threshold is essentially to reduce oil imports. This threshold is obviously difficult to estimate, but it is most likely between 200,000 and 400,000 barrels per day. This represents four to eight commercial-size plants of alternative technologies and resources. A strong case can be made to set a program at this level on the grounds that the United States will eventually have to change to alternative fuels and that

such a base of knowledge will help in choosing those resources and technologies that would allow an efficient transition.

Whether or not a synthetic fuel production goal will be set above this threshold depends on the level of dependence on imported oil that the United States desires to maintain; this decision depends on economic and defense risks, as well as on how additional synthetic fuel production ranks in relation to other oil import reduction programs. For example, if the United States is going to lower its 1990 oil import level from the projected 12 million barrels a day to 8 million, then the first programs chosen to meet this objective should be those that rank highest in terms of oil import savings per dollar. While the Congressional Budget Office (CBO) has not performed a comprehensive analysis of this issue, some alternatives appear to rank higher than additional synthetic fuel production in terms of oil import savings per dollar; these include aggressive residential and even commercial insulation programs, accelerated retirement of oil and gas boilers in both utilities and the industrial sector, production of tight gas and heavy oils, and expanded solar hot water and space heating and cooling. Synthetic fuel production above the level of 200,000-400,000 barrels per day becomes attractive only if the United States desires to reduce the oil import levels by 1990 below the 8 million barrels a day.

A synthetic fuel program on the order of several million barrels per day of oil equivalent could, of course, provide the United States with

considerably increased economic and defense security, but could pose substantial economic and possible environmental strains. For example, a production goal of 3 million barrels per day would require a capital investment of more than \$120 billion over a ten-year period, which could create shortages in a number of materials as well as skilled labor. Such shortages would undoubtedly be inflationary and may in fact be more inflationary than the impact of significant increases in future OPEC prices. The primary potential environmental problem is that we do not have sufficient information to know how to develop future environmental regulations.

The Advantages and Disadvantages of Alternative Financing Mechanisms

The private sector has not yet been willing to invest the approximately \$2 billion necessary to build a synfuel plant of sufficient size to take advantage of the economies of scale common to such processes. The various risks are just too high. First, while it is almost certain that synthetic fuels can be produced, specific processes have not been demonstrated on a sufficiently large scale to offer businessmen the level of certainty that they traditionally desire regarding cost and technology. Second, regulatory uncertainties complicate both the cost and technological problems. For example, synfuel plants quite commonly require 25,000 tons per day of coal

for feedstock; consequently, a change in surface mining regulations or in Interstate Commerce Commission transportation rates could create havoc with the financial viability of a synthetic fuel project. Finally, it is possible that future world oil prices will not increase as rapidly as they have in the last few years and that they may in fact fall in real terms, thus increasing the relative cost of synfuels.

In developing a synfuels program, the federal government should choose the financing mechanism that will allow the government to absorb the risk that future OPEC prices will not decrease in real terms or even increase as fast as expected. The nation as a whole benefits from lower OPEC prices and, therefore, government should be willing to absorb that risk. On the other hand, the technological and cost risks should be absorbed by the private sector, which traditionally accepts these risks in making investment decisions. Such a separation of risks should maintain the incentives within the private sector to construct and operate synthetic fuel plants efficiently. In addition to the goal of efficiency, the financing mechanism chosen should have a predictable impact on the budget and should be considered in the normal budget process.

The financing mechanisms available to the federal government include loans, loan guarantees, purchase agreements, and actual government construction of the plants.

Given the size of the investment required for these plants, as well as the overall risk, it is very doubtful that federal government loans, even at subsidized rates, would be a sufficient stimulus for the private sector to construct the plants. Alternatively, if the federal government were to build these plants directly, it would then absorb all the risks—that is, the technological and cost risks, as well as the risk associated with any future changes in OPEC prices. This would give contractors less incentive to build the most cost-effective plants, since no private sector money would be at risk. Overall efficiency would, therefore, be reduced.

Loan guarantees have a similar problem in that much of the cost and technological risk of building plants would be shifted from the private sector to the government sector, and this would reduce the incentives for efficiency. Furthermore, from a budgetary standpoint, loan guarantees for large-scale projects are undesirable since they tend to obligate the federal government to a possible future outlay that does not have sufficient appropriation and is not included in the normal budget resolutions. Loan guarantees are more appropriately used for programs such as housing, in which the individual projects are small and the default rates can be predicted with a reasonable degree of accuracy. Extremely large loan guarantees could also tend to reallocate capital within the normal capital markets.

Purchase agreements, whereby the federal government contracts to buy a given amount of synthetic fuel production, have a distinct advantage over alternative funding mechanisms in that the private sector absorbs the technological and cost risk and, therefore, maintains a strong incentive to build cost-effective plants. The federal government, on the other hand, absorbs the risk that OPEC prices will fall in real terms or not increase as fast as expected. From a budgetary standpoint, they also have the advantage of being included in the budget resolutions and are predictable outlays over time.

Fuel Type, Resources, and Technologies

Fuel Type. Since the United States has an abundant supply of solid coal and the potential for domestic, Alaskan, and Mexican gas, and since low- and medium-Btu gas production processes are economically and technologically viable, the most probable future shortages will occur in liquid fuels. Consequently, any synfuel program would most profitably be oriented toward producing either liquid fuels or fuels that can free up liquids for alternative uses.

The federal government should probably ensure that diverse resources and technologies are developed so that ample technological, cost, and

environmental information is obtained. Therefore, certain minimum levels of synfuel production by resource should be established. For example, levels could be set at 100,000 barrels per day of shale oil and coal liquids, and at 50,000 barrels per day for biomass. Failure to set minimum levels would run the risk that all synfuel production would be produced via one technology with little information gain. Other than requiring that several alternative technologies be utilized, however, the federal government should leave the specific technology choices to the private sector, where the technological expertise currently resides.

Conclusion

In conclusion, Mr. Chairman, a number of benefits--such as economic and defense security and lower future OPEC prices--would occur from synthetic fuel production; most of these benefits, however, would be similar to those flowing from any federal program that reduces oil imports. The unique benefit of a synfuels program is that it would develop a critical information base to assist in the eventual conversion to alternative fuels. Synfuels programs producing more barrels per day than this information threshold, however, should be implemented only if the United States wishes to reduce its 1990 import levels below 8 million barrels per day, since a number of alternatives are most likely more cost-effective than synfuels in

reducing oil imports to about that level. Finally, with respect to financing mechanisms, purchase agreements appear to be more desirable than loan guarantees in stimulating an efficient synfuels industry.

Mr. Chairman, I would be happy to answer any questions.

