



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

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July 27, 1979

The Honorable Gary Hart
Chairman, Subcommittee on
Synthetic Fuels
Committee on the Budget
United States Senate

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Dear Senator Hart:

This letter is in response to the questions raised in your letter of July 19, 1979. You requested our views on various aspects of proposals to accelerate synthetic fuel development. The questions posed were:

- Whether synthetic fuel development should be an on- or off-budget activity.
- Whether the various proposals would develop a competitive synthetic fuels industry.
- Whether such an industry would need Federal subsidies or other forms of Federal regulation and intervention to make it successful.
- What are appropriate national goals for synthetic fuel production and the appropriate technical means to achieve those goals.
- What financial mechanisms might be most helpful in achieving those goals.

Because you asked for a very quick response, this letter of necessity does not represent an indepth analysis of all aspects of your questions. Nonetheless, we have been concerned with many of the issues raised for some time and hope that the following comments may be of some value to you.

Before addressing the five specific questions you raised, we would like to offer for your consideration some comments on two other basic issues: the importance of a significant effort to develop synthetic fuels and the need for a separate organization to encourage that development.

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(990515) Subsidies



The events of 1979 and the earlier embargo of 1973-74 have amply demonstrated our dependence on imported oil and the threats that dependence poses to our national security and economic health. While there is clearly a significant long-term energy crisis, these events point out that the most immediate and possibly most serious aspect of that crisis is in liquid fuel. Furthermore, the experience of the past six years, while encouraging in some respects, has not reduced our vulnerability to damage caused by oil price increases and supply disruptions. Our work in the energy area leads us to believe that the United States will never be able to produce conventional oil in anything like the quantities needed to substantially insulate ourselves from the OPEC-dominated world oil market. For that reason, we believe it important that the United States move to develop alternatives to imported oil. Such an effort should be placed in the context of overall national energy policy and synfuels should play a part.

The four bills you asked us to comment on, along with the Administration's recent proposal, all intend to develop a synthetic fuels industry through a variety of mechanisms such as loans, loan guarantees, price guarantees and construction of plants by the Government. In our view, every effort should be made to establish the atmosphere to encourage private industry to invest in and operate the plants.

Unfortunately, such an industry will, at least in the medium term, be expensive. Also, because it will be complex, capital intensive, and technologically novel, we will not see significant synthetic fuel production until the late 1980s. Nonetheless, since oil crises will almost certainly recur and may become ever more serious in the 1980s, 1990s, and beyond, a national commitment to reducing our dependence is warranted.

While synthetic fuel development is clearly an important and worthwhile national goal, we believe that conservation should take just as high or even a higher priority. Conservation is likely to be considerably cheaper on a per-barrel-of-oil basis, will have a surer and more rapid payoff, and can be implemented on every level, from individual citizens, up through businesses, local governments, and including the Federal Government, and even international bodies. These two emphases--synfuels to provide liquid fuels and feedstocks

for the medium to long term, and conservation both now and throughout the future--seem to us to provide both the decisive action and the balanced program the Nation needs. We should also keep in mind that our ultimate goal should be to move to renewable energy sources. Synthetic fuel development and even conservation should be integrated into that long-term goal. We discuss the issue of program balance more fully beginning on page 7.

Another basic issue is whether we need a separate entity charged with synfuel development and conservation. The Administration's proposal as well as three of the four bills your staff asked us to examine would authorize a separate corporation. We believe that such an entity may be appropriate for synfuel development, but not for conservation. The Administration's suggestion to establish an Energy Security Corporation--with several modifications which we suggest further on in this letter--seems to be a responsible way to promote synfuel development. This is not the case with conservation because many of the actions needed are only appropriate to Government (e.g., setting mileage standards, reform of building codes, various forms of mass transit, etc.). Furthermore, charging one body with two so disparate functions would probably result in its doing neither very well.

BUDGETARY STATUS

Your first question asked us to address whether a corporation should be on- or off-budget. The Administration's proposal would establish an off-budget corporation. The four bills you asked us to comment on would establish on-budget programs.

We have consistently taken a position against the establishment of off-budget agencies and programs. We have taken this position because off-budget agencies deprive the Congress of appropriate control and oversight. Off-budget funding short-circuits the normal authorization/appropriation process, making effective oversight difficult if not impossible. It would also insulate the corporation budget from competition with other areas worthy of Government funding. On the other hand, off-budget status would largely remove the corporation's deliberations from the political arena. It would enable the corporation to concentrate entirely on energy production rather than justifying itself and its activities to competing interests

promoting specific technologies and geographic areas. We note that, while the proposal would eliminate Congressional oversight once the Corporation is established, the Administration would maintain some degree of control through the apportionment process.

We would urge consideration of a middle ground through the use of on-budget multi-year funding, eliminating the uncertainty of annual appropriations but requiring periodic Congressional review, say every 2 or 3 years.

COMPETITIVENESS

Your question on whether these proposals would develop a competitive synfuels industry can be viewed from three complementary perspectives. First, synfuels would be in direct competition with conventional oil and gas. All observers agree that synfuels would be more expensive, hence the need for subsidies. Such subsidies could be needed indefinitely. Synfuels have always seemed slightly more expensive than conventional oil and this relationship may well continue. On the other hand, if the petroleum resource base is rapidly depleted, conventional oil costs may finally reach synfuel levels, eliminating the need for subsidies. There is no way to project this process reliably because it depends on how quickly synfuel costs can be reduced and also on the OPEC-determined world price of oil. This uncertainty could be dealt with by establishing a schedule for phasing out the subsidy or by periodic independent evaluation and adjustment of the subsidy. A fixed phaseout schedule has the virtue of certainty, but may damage the synfuel industry if oil prices do not rise at the expected rate. A periodic evaluation program does not guarantee when subsidies will end, but should keep the subsidy level as low as practicable.

Another aspect of competition is between firms engaged in synfuel production. If Government is the prospective purchaser of the fuel, it can create competition of one kind by soliciting bids for synfuel contracts or price or purchase guarantees. Whether there would be meaningful competition among firms selling synfuel in the open market is a more difficult question. The size of needed investment may bar all but the largest firms from entry into the synthetic fuel industry. Some firms may develop an overwhelming technical advantage. When encouraging development of such a large industry, it is clearly incumbent on the

Federal Government to keep alert to possible anti-competitive practices.

The third perspective on competition is how a synfuels industry may affect related industries, especially coal. In a recent report 1/ we found that the coal industry was workably competitive and that coal resource ownership by oil companies did not give the oil companies undue market power. One of the underlying reasons for this conclusion was that oil and coal are substitutable in very few uses. Therefore, oil companies could not exercise control of oil price by manipulating coal production or vice versa. However, once coal is liquified or gasified, it is obviously a close substitute for conventional oil and gas. Thus, if coal-based synfuels are to become a prominent part of future energy supply, closer attention should be paid to oil company involvement in coal reserve ownership and production.

NEED FOR FEDERAL SUBSIDIES

Your questions concerning the need for Federal subsidies or other forms of market intervention are very closely related. Since the most important types of Federal intervention being contemplated for synthetic fuels are subsidies, we will comment on these two questions simultaneously.

As we pointed out in answer to the previous question, synfuels are not competitive with conventional oil and will not be so for the foreseeable future. This is even truer for OPEC oil, whose costs of production are reportedly much lower than for domestic crude. As a general rule, subsidies would be needed until the OPEC-determined world price of oil was slightly above synthetic oil production costs. If these two figures approach each other, subsidies could be progressively reduced.

Ironically, a successful synfuel production program could have the effect of making subsidies for synfuels necessary for quite a long time. This is because a successful program would reduce U.S. demand for OPEC oil, making the world market softer and keeping OPEC prices

1/"The State of Competition in the Coal Industry",
EMD-79-22, Dec. 30, 1977.

lower than they would have otherwise been. If this were the case, continuing synfuel subsidies would be a sign of success, not failure.

GOALS OF THE PROGRAM

You also asked us to address the national goals that the President and others seek to achieve and the various means to achieve them. The fact sheet explaining the Administration's proposal states that the Corporation will determine the mix of the sources and technologies which will be used to meet its 2.5 million-barrels-per-day (MMB/D) goal, but provides an "illustrative" division of sources. It indicates that 1 to 1.5 MMB/D might come from coal, 0.4 MMB/D from oil shale, between 0.5 and 1.0 MMB/D from unconventional gas, and 0.1 MMB/D from biomass.

Producing 1.0 to 1.5 MMB/D of synfuels from coal by 1990 may be possible, but preliminary information from knowledgeable industry contacts suggests that we should count on closer to 1.0 MMB/D. There are considerable problems involved in building the 15-25 plants that would be required as well as mining the coal needed to feed the plants. We would note that the entire World War II German synfuel program produced only about 70 MB/D, about equal to one such plant. Getting the additional capital, manpower and equipment that would be required for both aspects of the program simultaneously could be a major obstacle.

Then there is the question of the readiness of technology. There are two proven coal technologies operating elsewhere in the world: a European coal gasification system, and the South African "SASOL" indirect coal liquefaction method. The length of time required to design and build such large plants indicates that these will probably be the two technologies which can be in operation by 1990, unless we accept the higher risk associated with unproven new technologies. There is a danger, however, of getting overcommitted to an early, inefficient technology. The program managers, as well as the Congress, must maintain the flexibility to adapt to new technologies as they become available.

Under the Administration's plan, for example, the corporation would be specifically barred from carrying out research and development, presumably because these pre-commercial activities would interfere with its primary

purpose--to produce energy. However, bringing currently unused technologies on stream will surely entail the demonstration and improvement of those technologies. Thus, it may be unwise to prohibit all research and development activities by the corporation. The distinction among research, development, demonstration, and commercialization is a fine one, and rigid prohibitions should be avoided. The Congress may well wish to permit some research and development which the corporation feels is necessary.

PROGRAM BALANCE

A number of "second generation" coal technologies and several approaches to oil shale, now under development, could be demonstrated by about the mid 1980s. It is widely believed that some of these will offer more efficient and less expensive production than the technologies presently ready. If the corporation targets for coal and shale were somewhat lower, a possible overcommitment to "first generation" technology could be reduced.

Proven biomass technologies, already producing substitute fuels in commercial operations in the United States, could be expanded well beyond the 0.1 MMB/D level by 1990 to take up the slack. Energy production from municipal solid waste and alcohol production from surplus crops and agricultural wastes are the most practical.

We recently reported ^{1/} that municipal solid waste could provide over 0.1 MMB/D by 1985, and over 0.4 MMB/D by 1995. Advocates of gasohol have argued that set-aside agricultural land and crop wastes could also yield several hundred thousand barrels per day. We are currently completing a study of gasohol which tends to confirm this.

To the extent that the Corporation can accelerate the expansion of these biomass synthetic fuel industries, it can meet its target with a more limited commitment to present coal technologies. At the same time, the United States could continue its coal and shale-based synthetic fuel development beyond 1990 on a more informed basis,

^{1/}"Conversion of Urban Wastes to Energy: Developing and Introducing Alternate Fuels from Municipal Solid Waste", EMD-79-7; Feb. 28, 1979.

with answers to many difficult technical questions in hand.

On the whole, the Nation needs a program which is balanced between conservation and renewable initiatives as well as synfuels. Conservation and renewables would include all investments in energy efficiency improvements, technologically ready renewables such as solar water and space heating and passive solar construction, which are being kept off the market for economic reasons, as are synthetic fuels. A key to stimulating conservation and renewable-energy investments would be to subsidize them on a per-barrel-of-oil-saved basis up to the level of the subsidy for synfuels. Fuel switching from oil to coal may also pay off handsomely. We are completing a study for the Chairman of the Subcommittee on Energy of the Joint Economic Committee which analyzes the potential of conservation measures and discusses how a comprehensive conservation program could be formulated.

The Administration's proposal does include initiatives on all of these fronts, but they may not be balanced. For example, the synthetic fuel initiative involves spending \$88 billion for 2.5 MMB/D capacity or \$35,200 per barrel-day. In contrast, the residential and commercial conservation proposal is estimated to save 0.5 MMB/D with \$2 billion of expenditures, or \$4,000 per barrel-day. This disparity suggests that more import reduction could be obtained by greater expenditures for conservation investments before a true balance was reached. The balance point would be the level where the next b/d of import reduction would cost the same whether accomplished by conservation, renewables, or by synthetic fuel production. Many conservation investments would also yield oil savings much sooner than the 5 to 7 years needed to build a large synfuel plant.

In addition, many conservation and solar technologies are classed by a DOE Environmental Readiness report as likely to result in net environmental benefits or have only low-to-medium probability of serious detrimental environmental impacts. This contrasts with synthetic fuel technologies, which are quite likely to have serious adverse environmental impacts.

Finally, many of the conservation and solar installations would be relatively small scale, widely distributed units which would involve large numbers of Americans in the

psychological lift of "doing something" to combat the energy problem. This wide participation could contribute to allaying the popular distrust in the reality of the energy crisis and providing our citizens with a sense of personal commitment to our energy future.

FINANCING MECHANISMS

A complete answer to your question of which financing mechanisms would be most appropriate to promote synfuel production would have to be based on considerably more information than is presently available. For example, we would have to know details of the specific projects being considered along with the set of alternative financing mechanisms which could be used in each case. However, there are some observations we can make at this time. Loan guarantees have become popular because supporters of guarantees argue that the program is costless in the absence of a default. If the borrower repays the loan, the budgetary impact would be limited to administrative expenses. In the case of default, however, the liability to the Government becomes substantial--possibly greater than any other subsidy method. Furthermore, with very few but very large loans, it is difficult to establish an adequate default reserve. The 1-percent per annum reserve the Administration advocates would probably be insufficient to cover the default of one coal liquifaction or gasification plant. There is also the cost of diverting capital to the guaranteed investment from other areas which may be more productive and would have been chosen in the absence of the guarantee.

Loans and loan guarantees may not induce private firms to produce synfuels. After all, at current prices a firm would have no reason to think that anyone would buy synfuels without some sort of price subsidy or purchase guarantee, inasmuch as conventional OPEC or Mexican oil will most likely be cheaper, at least in the near future. And, a purchase guarantee would not work without a price guarantee. A more certain way to assure synfuel production is to provide a price guarantee coupled with a purchase guarantee. This could be very costly, although the Government could solicit proposals to supply the synfuel at the lowest possible price. One problem is uncertainty. Firms will not actually know in advance how much synfuel production will cost and may want a cost-plus contract. Given the potential for cost overruns, cost-plus contracts should be avoided if at all possible.

At this time, the loan guarantee limits of the Administration's proposal are unclear. The implications in papers we have seen are that all loan guarantee commitments would have to be met within the \$88 billion of authority. But this is not explicitly stated and needs to be clarified. One part of the Administration's proposal appears to us to be undesirable. That is the provision permitting the purchase of Federally guaranteed loans by the Federal Financing Bank. We do not agree with this because it has the effect of changing the loan guarantee into a backdoor direct loan.

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In summary, we believe it makes sense to increase the emphasis on synthetic fuel development as part of a balanced energy program. It may also be appropriate to establish a separate organization for this purpose. That organization, however, should not be shielded from Congressional oversight through the budget process, although multi-year funding seems to be a reasonable approach. We also believe equal or greater emphasis needs to be placed on conservation and renewable energy sources. As arranged with your office, we are sending copies of this letter to the Secretary of Energy and to the Chairmen of other energy-related committees.

Sincerely yours,



Comptroller General
of the United States