Synfuels: Data Gap Imperils "Coalcon" Demonstration

In its haste to accelerate development of synthetic fuels, the government committed itself after the energy crisis of 1974 to a high-risk policy of trying to push rapidly ahead with plans for demonstration projects even though research at the pilot-plant scale might be inadequate and inconclusive. Some early results of that policy are now emerging, and they are not encouraging. On 21 December, the Energy Research and Development Administration (ERDA) announced euphemistically that plans to begin construction of its first big synfuel demonstration plant in 1977 are now being "reevaluated." In fact, construction of this project—known as the Clean Boiler Fuel Demonstration Plant Project, or "Coalcon"—almost certainly will not be undertaken before 1980, if indeed it ever is.

The project, on which $14 million has thus far been spent (mainly on design work), is a joint government-industry venture to demonstrate that high sulfur eastern coal can be converted to clean liquid fuel and synthetic gas for utility and other industrial boilers. Intended for a site near New Athens, Illinois, the demonstration facility is designed to use 2600 tons of coal a day and produce 3500 barrels of liquid fuels and 22 million cubic feet of pipeline gas.

According to the terms of the contract signed in January 1975, the government and the Coalcon Company—an entity formed by Union Carbide and Chemico (a subsidiary of Aerojet General)—agreed to share, fifty-fifty, the cost of building the demonstration plant, then estimated at $237 million but now estimated at $440 million. Coalcon, in turn, was looking to a number of other corporate entities, such as Dupont, Reynolds Aluminum, Sun Oil and Ashland Oil, and (ultimately) the Electric Power Research Institute (EPRI), to share in supporting the project, and was obtaining letters of intent from them. The government assumed responsibility for all design and other preconstruction costs and agreed further that neither it nor Coalcon (now owned solely by Union Carbide) would be definitely committed to the project until September 1977, when construction was to begin.

The coal conversion method in question is the hydrocarbonization process developed during the late 1950's and early 1960's by Union Carbide. It was tested in a small pilot facility using western coals that are markedly different from the eastern caking coals which Coalcon would use. This early project, which had the aim of producing chemical feedstocks, was abandoned in 1964 after it became apparent that feedstocks from coal would not be competitive with those from oil.

Union Carbide resurrected the hydrocarbonization process in 1974 when the Department of Interior's Office of Coal Research (whose functions were transferred to ERDA in 1975) solicited proposals for the conversion of eastern high sulfur coal to clean boiler fuels. Since then, the process has been tested only in a "miniworks" having a 4-inch hydrocarbonization reactor that is a far cry from the two 8-foot-diameter reactors called for in the demonstration plant design. Although Union Carbide says the miniworks tests have been encouraging, there is nevertheless serious doubt as to how well the process will work with the high sulfur eastern coals, which tend to stick together when heated.

In recent months Union Carbide, EPRI, and several of the other more technologically sophisticated members of the proposed consortium have concluded that the demonstration plant should not be built without testing the process in a pilot facility built to a significantly larger scale. ERDA, which has had the project under review since late last winter, has reached about the same conclusion.

Yet to construct the new pilot facility, with its 2-foot-diameter reactor, and carry out the necessary tests will cost from $5- to $10-million and take perhaps 3 years or longer.

In announcing the "reevaluation," Philip C. White, ERDA's assistant administrator for fossil energy, noted that the economics of the hydrocarbonization process—even if it works properly—now appear marginal when compared to such coal conversion processes as the solvent refined coal process developed by the Gulf Oil Corporation. (And, of course, fuels from the other processes could not compete with oil and natural gas at present world prices.) White said that, should the economics look better once the present design phase is completed in June, the demonstration could proceed if Coalcon put up its share of the money. But Coalcon is simply not going to do this.

If the Coalcon plant is ultimately built, it probably will not be operating before about 1983, and the demonstration will not be completed before the mid-1980's. This means that any commercial clean fuels plants which might be designed to use the hydrocarbonization process, as tested and proved in Coalcon, would probably not be operating until sometime well into the 1990's.

Everybody now seems to agree that it was a serious mistake to try going to the demonstration stage without more pilot facility testing. With this hindsight, officials at ERDA and their overseers in Congress will be keeping their fingers crossed lest some of the other big synfuels demonstration projects now pending—two pipeline gas projects and two low-BTU gas projects have been authorized—have to be delayed or aborted because of insufficient testing at the pilot-facility scale.

S. William Gouse, ERDA's deputy assistant administrator for fossil energy, indicates that such difficulties could indeed arise because the commitments to demonstration-level projects were all made in an atmosphere of urgency and without as much pilot-scale testing as would normally be desired. On the other hand, there seems to be some confidence at ERDA that, if there are serious data gaps in these other demonstration projects, none are so obvious and troubling as the one that has beset Coalcon.

As for the future, the attitude at ERDA and in Congress is likely to be more cautious. In fact, this past year the House Committee on Science and Technology rejected a coal liquefaction demonstration project as premature.

And, at this very moment, Representative Leo J. Ryan (D–Calif.), chairman of the House Government Operations Subcommittee on Conservation, Energy, and Natural Resources, is upbraiding ERDA for "poor management" in its handling of the Coalcon project. The criticism seems a bit unjust in light of the fact that the Coalcon contract was entered into by Interior and not ERDA. But it can be taken as another sign that Congress, which reflected and helped generate the anxious atmosphere that attended the energy crisis, will now insist that synfuels R & D and demonstrations follow a more orderly and prudent course.

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