

# FEATURE

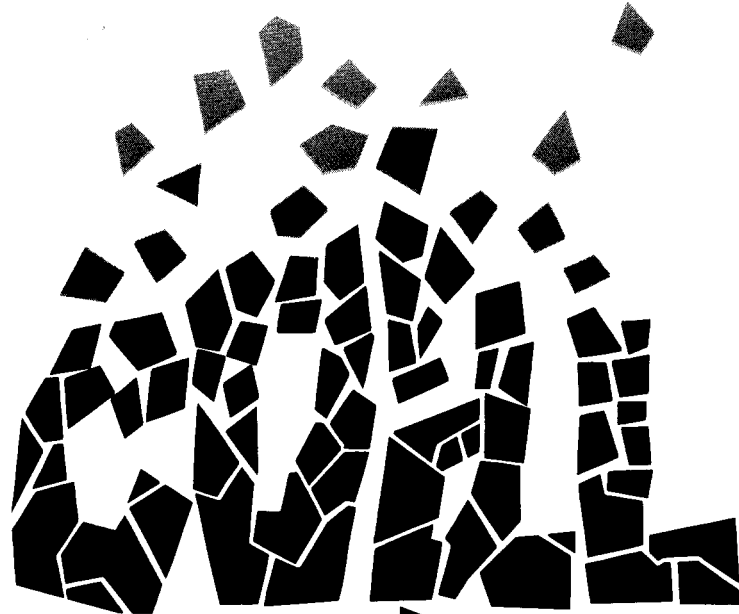
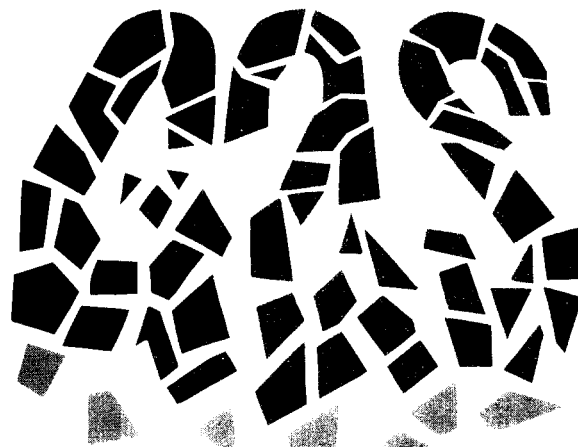
## ERDA's fossil energy activities

Synfuels from coal and enhanced methods to recover oil, natural gas and oil shale may be competitive and socially acceptable options to alternative energy sources in the not-too-distant future

**Philip C. White**

*Energy Research and  
Development Administration  
Washington, D.C. 20545*

# Gas



# Coal

## Highlights of the direction of ERDA's activities

The Energy Research and Development Administration (ERDA), established January 19, 1975, inherited the coal, petroleum, natural gas, and oil shale programs that principally originated in the Department of the Interior's Office of Coal Research and the Bureau of Mines. The newly created agency greatly expanded its horizons for fossil energy technology in 1975-76. During this year it moved toward the implementation of large demonstration projects for converting coal to clean fuels.

Significant progress also was achieved in developing the Fossil Energy Research Program. Here ERDA was able to enlist university participation and to secure industrial contributions to cost-sharing projects for the enhanced recovery of petroleum and natural gas.

The new Fossil Energy organization, headed by an assistant administrator and a deputy assistant administrator, consists of five program divisions:

- coal conversion and utilization
- fossil energy research
- fossil demonstration plants
- MHD (magnetohydrodynamics)
- oil, gas and shale technology.

Staff offices include Program Planning and Analysis, an Administrative Office, and the Senior Staff for special assistance and counsel.

The conversion and utilization of coal, the Nation's most abundant fossil fuel, was given high priority in ERDA's National Energy Plan. An updated version of the Plan, issued in April 1976, placed more emphasis on conservation. Light-water-nuclear reactors and the enhanced recovery of oil and gas were also ranked as fuel sources that could be tapped to bridge the energy gap between now and the year 2000. After these energy sources, ERDA foresees the successful development of more inexhaustible supplies of energy such as the breeder reactor, solar, electric, and fusion.

### Fossil energy activities

In essence, the Fossil Energy program seeks to develop and demonstrate, in conjunction with industry, the technology necessary for establishing a synthetic fuels-from-coal industry, as well as for improving methods to recover petroleum, natural gas, and oil shale. These objectives have the potential for being economically competitive with alternate energy sources and environmentally and socially acceptable in the near-term (by 1985) and mid-term (by 2000).

To achieve its objectives, the Fossil Energy program has grown substantially, as reflected by the dramatic increases in budgetary funds. In fiscal year 1975, expenditures totaled \$204 million, nearly triple the \$76 million expended in fiscal 1974. In fiscal 1976, the budget increased to just under \$350 million and, for fiscal 1977, funding requests amount to \$442 million (Table 1). These figures do not reflect cost-sharing funds put up by contractors.

Industry cost sharing is concentrated in the more advanced phases of coal conversion and in the enhanced recovery of oil and gas, although there is some agency cofunding in earlier developmental stages. A typical development sequence from

• A request to industry and others for technical proposals to design, construct and operate a demonstration plant for converting coal to pipeline-quality (high Btu) gas. ERDA received five proposals that were being evaluated. Such a plant would supply data for scale-up to commercial-sized facilities producing gas from coal and/or lignite.

• A request for proposals (RFP) to design, construct and operate demonstration projects for converting coal into clean fuel (low Btu) gas for power generation and on large- and small-scale industrial users. Fourteen firms responded to the RFP.

• Award of contracts to develop engineering information on magnetohydrodynamics (MHD) generators and systems for testing in a component development and integration facility to be built near Butte, Mont.

• RFP's to perform studies of high-temperature gas-turbine-combined cycle development program operating on coal or coal-derived fuels. Four large manufacturers were selected to perform the first phase of a six-year program at the initial cost of approximately \$5 million.

• Selection of the Curtiss-Wright Co. (Wood-Ridge, N.J.) to negotiate a contract to build and operate a pilot electric generating plant using advanced technology to burn high-sulfur coal. The plant would use a coal-fired, pressurized fluidized-bed combustion technique to power steam and gas turbines in a combined cycle operation.

• Initiation of site preparation work for the H-Coal pilot plant to be built at Catlettsburg, Ky. The plant, the largest of its kind, would process up to 600 tons of coal daily in the production of clean liquids.

• Issuance of a program opportunity notice (PON) for proposals to develop and demonstrate a fluidized-bed concept for clean burning of high-sulfur coal and coal waste in industrial boilers and heaters. Thirteen proposals were received from industry and cost-sharing contracts are expected to be awarded by the end of 1976.

• RFP's to design, develop, test and evaluate valves to be compatible with operating conditions encountered in various coal gasification plants.

• Issuance of two RFP's to demonstrate methods for recovering oil from tar sands.

• Issuance of two RFP's for field demonstration projects with use of a micellar-polymer chemical flooding process to recover crude oil. One of the RFP's asks for small pilot projects, the other for one large-scale project, using the recovery technique.

• RFP's for projects to stimulate natural gas production by hydraulic and chemical explosive fracturing methods that could release the vast amounts of fuel now locked in tight geological formations.

• RFP's for field demonstration projects with use of carbon dioxide injection methods to recover crude oil from shallow underground reservoirs.

• RFP's for field demonstration projects with use of thermal processes to recover crude oil.

• The award of millions of dollars in cost-sharing contracts with industry to test improved methods for the enhanced (secondary and tertiary) recovery of oil and gas. By 1985, ERDA expects this technology to add 2 billion barrels of oil and 10 trillion cubic feet of natural gas to U.S. reserves. This would mean an increase in production of 500 000 barrels of oil per day and 3 billion cubic feet of natural gas per day.

• Distribution of a PON seeking proposals for the development of technology to recover shale oil in place.

• Launching of a new program to stimulate the production of natural gas from Devonian shale in the eastern U.S. Trillions of cubic feet of gas, locked in tight formations, cannot be developed economically with current technology.