

**LRC-I-8**  
**STUDY TO DETERMINE THE TECHNICAL AND**  
**ECONOMIC FEASIBILITY OF A LONG-TERM**  
**UNDERGROUND COAL GASIFICATION TEST**

**CONTRACTOR:** Energy and Environmental Research Center

**PRINCIPAL INVESTIGATORS:** Craig R. Schmit & Gerald H. Groenewold  
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**PARTICIPANTS**

<u>Sponsor</u>	<u>Cost Share</u>
EERC/Gas Research Institute (see LRC-III-17)	<sup>1</sup> \$363,501
ND Industrial Commission	<u>30,000</u>
<b>Total</b>	<b>\$393,501</b>

**Project Schedule – 15 Months -  
Extended 4 Years**

Contract Date – 9/14/88  
Start Date – 1/13/89  
Completion Date – 3/92

**Project Deliverables**

Status Reports ✓  
Final Report – 3/20/92 ✓

**OBJECTIVE / STATEMENT OF WORK**

The initial objective of this effort was to determine the technical and economic feasibility of a long-term, multiwell underground coal gasification (UCG) test leading to commercialization of the process in the vicinity of the Great Plains surface gasification plant. This program was combined with LRC-III-17, and resulted in the development of a conceptual model to evaluate UCG processes and product options at potential sites.

**STATUS**

The conceptual model considered the utilization of a linked-vertical-well UCG process to produce low-Btu gas (~100 Btu/scf) for cofiring in a pulverized coal-fired boiler to produce 8.68 megawatts of electricity (MWe). The UCG gas would provide 2-10% of the fuel for the boiler. Economic analysis of an 8.68 MWe plant revealed that it would be difficult to demonstrate economic potential in today's market without costshare, considering the mid-March 1992 wellhead price of gas. Expansion of the demonstration to produce 44 MWe, assuming a 50-50 federal cost share, a total investment of \$19 million, and a gas selling price of \$2.65/MMBtu, would produce a return of investment of 12%. Because of the low-Btu value of the gas, the UCG

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<sup>1</sup> The expenditures for the underground coal gasification project during the time frame of January, 1989 through March, 1992 totaled \$727,002. Separate expenditures for LRC-I-8 and LRC-III-17 were not kept; therefore, GRI's cost share has been split evenly between the two projects.

site should be located close to the boiler in order to minimize the cost of gas transmission. On a commercial scale, the UCG process will interact strongly with the local hydrogeologic environment. These interactions can be anticipated, not controlled. For this reason alone, site selection is the key factor in both the technical and economic success of UCG on a commercial scale.