

LMFS-1 (RFP-91-1)
LIGNITE MARKETING FEASIBILITY STUDY

CONTRACTOR: J. E. Sinor Consultants, Inc.

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CONTRACT AMOUNT: \$180,605

Project Schedule – 7 Months

Contract Date – 10/15/91
Start Date – 10/15/91
Completion Date – 4/1/92

Project Deliverables

Status Report – 1/15/92 ✓
Interim Report – 2/1/92 ✓
Draft Final Report – 3/9/92 ✓
Final Report – 4/1/92 ✓

OBJECTIVE / STATEMENT OF WORK

The objective of this project was to perform a lignite market assessment scoping study. The work statement included:

- 1) an analysis of the existing resource base including information on properties and characteristics of North Dakota lignite, strengths and weaknesses of resource production and conversion processes, transportation infrastructure and current markets;
- 2) an analysis of current and emerging national and international lignite applicable technologies and an analysis of those which offer a high level of probability for rapid commercialization;
- 3) projects of potential near-term (5 to 10 years) expansion which may occur as a result of technology improvements;
- 4) identification and analysis of statutory and regulatory constraints that could impede the development of North Dakota lignite;
- 5) an assessment of possibly attractive Clean Coal Technology projects in North Dakota; and
- 6) recommendation of a strategy and implementation plan to facilitate development of priority opportunities.

STATUS

This market assessment by Sinor concluded that lignite will remain, primarily, a mine-mouth feedstock for power plants or conversion plants. Increases in demand for electricity will occur in areas south and east of North Dakota. The best near-term prospect for increasing lignite use in North Dakota is incremental additions to capacity at the existing lignite-fired power plants. Electricity demand growth in the Mid-Continent Area Power Pool (MAPP) region will result in the need for new baseload power plant capacity near the year 2000. Incentives must exist for new power plants to be located in North Dakota.

To serve the markets that will develop to the south and east of North Dakota, electrical transmission line capacity must be increased. Given current prices, Powder River Basin (PRB) coal can be delivered for a lower price per million Btu than North Dakota lignite (NDL) at all locations except North Dakota and western Minnesota. If lignite is to be the fuel of choice for future power plants, combustion technology must be available which can burn lignite at no economic handicap.

United States exports to Europe will increase. For NDL to compete in this market, an upgraded NDL product must be developed and it must be demonstrated that the upgraded NDL can be exported at a price competitive with upgraded PRB. Transportation rates and costs from North Dakota to the markets for an upgraded lignite must be identified and be competitive.

The investment in the Great Plains Synfuels Plant is equivalent to \$2,000 per person in the state. The financial footing of the Great Plains plant could be improved by converting a portion of the output to liquid products. Production of liquid fuels, recovery of carbon dioxide, and further byproduct development could improve the economic basis of the Great Plains plant. The development of a number of nonfuel products from lignite could offer an attractive rate of return on investment, but would have a small effect on overall lignite production.

Sinor identified a number of opportunities for the State of North Dakota to support the development of technologies based on the state's lignite. In the areas of lignite enhancement and preservation, the Sinor report can be summarized as follows:

Enhanced Lignite Development

- Lignite Energy Conversion – 3 million tons
 - Electricity
- Upgraded Boiler Fuel – 4 million tons
 - Europe
 - Great Lakes
- Lignite Niche Products – 1 million tons
 - Char/Flue Gas (300,000 tons)
 - Coal/Water Slurry Fuel (500,000 tons)
 - Activated Carbon (39,000 tons)
 - Fertilizers (40,000 tons)

Lignite Preservation

- Great Plains Diversification – 500,000 tons
 - Gasoline/Diesel Fuel
- Environmental Challenges/Solutions
 - NO_x
 - Air Toxics
 - CO₂
 - Groundwater
 - Externalities

The final report, "Market Assessment for North Dakota Lignite" issued on April 1, 1992, contains information on the background and future market potential for North Dakota lignite. The implementation plan in this report served as the basis for seven phase II marketing studies to evaluate opportunities and to enhance and preserve production of lignite. In addition, the study identified ten possible eligible projects for CCT funding from North Dakota. The two CCT V projects submitted from North Dakota were from program areas identified on this list.