

**LMFS-99-31**  
**TECHNOLOGY DEVELOPMENT AND MARKETING PLAN FOR THE**  
**LIGNITE VISION 21 PROJECT**

**CONTRACTOR:** Lignite Energy Council

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**CONTRACT AMOUNT:** \$132,000

**Project Schedule – 11 Months**

Contract Date – 6/29/99  
Start Date – 7/1/99  
Completion Date – 6/01/00

**Project Deliverables**

First Quarterly Report – 11/30/99✓  
Draft Final Report – 7/01/00✓  
Final Report – 8/01/00✓

**OBJECTIVE / STATEMENT OF WORK**

The purpose of the Lignite Vision 21 Project (LV 21) is to revitalize growth in the lignite industry. An objective of the LV 21 Technology Development and Marketing Plan is to assist in the development of additional lignite-based electrical generation in North Dakota.

Specific Project Management Objectives for the Phase I LV 21 are:

- establish and maintain project management over the Phase I contracts, activities and support studies;
- coordinate activities of the Advisory Committees providing technical and business expertise and assistance for development and implementation of the Lignite Vision 21 Project;
- identify the most promising advanced lignite-based generation technologies;
- identify environmental and transmission issues and enhancements;
- evaluate innovative alternative extraction technologies;
- develop marketing and development strategies for potential industry and government partners;
- develop a detailed Project Development Phase II plan;
- identify funding for Phase II; and
- develop the marketing, technology and commercialization plan for the Lignite Vision 21 Project.

Specific Advanced Generation Objectives are as follows:

- determine the development status of advanced technology systems;
- identify and describe each advanced technology system;

- identify the characteristics of North Dakota lignite and identify those characteristics that do not penalize and may provide a competitive advantage for North Dakota lignite;
- estimate technical performance and economics; and
- recommend most promising advanced technology system.

## STATUS

Project management of Phase I LV 21 activities were concluded with the successful completion of the four major studies and submission of the Phase II plan. The summary results of the four studies are:

1. **Electrical Transmission Study:** The Industrial Commission contracted directly with ABB Power and the Lignite Energy Council (LEC) provided project management and supervision for this study. The North Dakota Electric Transmission Study is project LMFS-99-33. ABB identified a transmission route that could accommodate up to 800 MW of additional generation and export from North Dakota. While no existing firm capacity is available for North Dakota export and non-firm capacity is available only part of the time, upgrading of the existing Antelope Valley-Huron line to 500 kV could provide an attractive option to increase North Dakota export. This option should be evaluated in more detail including site-specific consideration and stability studies (see LMFS-99-33 for details).
2. **Environmental Enhancement Study:** The Industrial Commission contracted directly with Research Data International and the LEC provided project management and supervision for the study. The Environmental Enhancement Study is project LMFS-99-32. The study concluded environmental impacts during construction and operation of a LV 21 power plant are within manageable levels utilizing current emission control technologies (see LMFS-99-32 for details).
3. **Advanced Generation Study:** The Lignite Energy Council subcontracted with Black & Veatch for the Advanced Generation Technologies Study. The Advanced Generation Study identified pulverized coal fired technology with supercritical steam, circulating fluidized bed and integrated gasification combined cycle as the technologies with the highest probability to meet the LV 21 criteria. Advanced technologies criteria are \$1,000/kW EPC Costs, < 0.15 lbs NO<sub>x</sub>/MBtu, and 0.18 lbs/MBtu SO<sub>2</sub>. Additional criteria and performance standards are presented in the report.
4. **Alternative Lignite Extraction Technologies:** The Industrial Commission contracted directly with Dakota Gasification Company (DGC) and the LEC provided project coordination and review. The Alternative Lignite Extraction Technologies study is project LMFS-99-30. The study identified underground coal gasification, a concept called LANL and coal-bed methane as alternative technologies that warranted further study.

The contractor, Lignite Energy Council, in consultation with industry/state agency advisory panels, developed a detailed project plan for LV 21 Phase II. Activities for Phase II are project management, identification of wholesale customers and equity owners, marketing activities and planning for Phase III.