PUBLIC ABSTRACT

Applicant (primary) name: Great River Energy

Applicant's address: Coal Creek Station, 2875 Third St. SW, Underwood, ND 58576-9659
Street City State Zipcode

Team Members (if any): EPRI, Palo Alto, CA 94304
(listing represents only participants at time of application, not necessarily final team membership) Name City State Zipcode

Lehigh University, Bethlehem, PA 18015-4729
Name City State Zipcode

Barr Engineering , Minneapolis, MN 55435-4803
Name City State Zipcode

Falkirk . Underwood, ND 58576
Name City State Zipcode

Proposal Title: Lignite Fuel Enhancement
Commercial Application: X New Facilities X Existing Facilities

The commercial application of the fuel enhancement technology applies to both new and existing plants

Other, Specify:

Technology Type: High Moisture Coal Enhancement by Incrementally Drying

Estimated total cost of project:
(May not represent final negotiated costs.)

Total Estimated Cost: $ 22,000,000

Estimated DOE Share: $ 11,000,000

Estimated Private Share: $ 11,000,000

PUBLIC ABSTRACT (contd)

Anticipated Project Site(s): Coal Creek Station, Underwood, ND 58576-9659
Location (city, county, etc.) State Zipcode

Type of coal to be used: Lignite
Primary Alternate (if any)

Size or scale of project: 11,400 tons/day
Tons of coal/day input

And/or

546 MW Megawatts, Barrels per day, etc.
Other (if necessary)

Duration of proposed project: 45
(From date of award) (Months)

PRIMARY CONTACT:

For additional information, interested parties should contact: Mr. Charles Bullinger
Name
Position Engineering Services Leader
(701) 442-7001
Telephone Number
Company Great River Energy
Cbullingers@grenergy.com
e-mail address
Address 2875 Third St SW
City, State, Zipcode Underwood, ND 58576-9659

Alternative Contact: Mr. Mark Ness
Name
Position Project Manager
(701) 442-7060
Telephone Number
Company Great River Energy
mness@grenergy.com
e-mail address
Address 2875 Third St. SW
City, State, Zipcode Underwood, ND 58576-9659

PUBLIC ABSTRACT (cont'd)

Public Abstract

LIGNITE FUEL ENHANCEMENT

Project Goal and Objectives

The goal and objective of this project is to significantly enhance the value of lignite as a fuel in electrical generation power plants within the next 5 years. Although current lignite power plants are designed to burn high-moisture coals (about 40%), a reduction in moisture content of 5 to 15 percentage points (about one quarter of the moisture content in the coal) will result in significant improvements.

All fossil steam plants reject large quantities of heat in the cooling water used to condense steam. Engineering studies at Great River Energy (GRE) Coal Creek Station show that this waste heat could be used to lower the moisture content of the coal by at least 10 percentage points (or one quarter of the moisture in the coal). Reducing the moisture content of the coal will translate into the following benefits for the U.S.:

- Increasing the net generating capacity of units that burn high-moisture coal.
- Increasing the new energy supply of units that burn high-moisture coal.
- Increasing the cost-effectiveness of the nation's electrical generation industry.
- Improving the environment by reducing emissions from coal-fired plants.
- Increasing the value of the nation's lignite reserves.

The cost benefits from improved plant performance, reduced emissions, and increased availability far out weigh the cost of drying the fuel. This work represents a potential landmark advance of fossil-steam plant performance improvement, emissions reduction and plant availability and is also applicable to Powder River Basin sub bituminous and biomass high moisture fuels as well.

Methodology

The benefits of reduced-moisture-content lignite will be demonstrated at the GRE Coal Creek Station in Underwood, North Dakota. A phased approach will be used. In the first phase, a full-scale prototype dryer module will be designed, for full power operation of one of the 546 MW units at the Coal Creek Station. Following successful demonstration of

the dryer and the performance improvements as a result of the dryer, GRE will design, construct, and perform full-scale long-term operational testing of a full suite of dryer modules for full operation of the unit on incrementally dried coal.

Sponsoring Organization

GRE is the principal project sponsor. Other collaborating organizations include Falkirk Mining and Couteau Properties, EPRI, Lehigh University and Barr Engineering. The point of contact at Great River Energy is Mr. Charles Bullinger (telephone 701-442-7001 and email cbullinger@GREnergy.com).