

Grant Round Application for LRC LXVIII (68)

TECHNICAL ADVISOR COMMENTS LRC-LXVIII (68) – B

“Oxy-Combustion Boiler Development for Tangential Firing of North Dakota Lignite”

Submitted by: Alstom Power, Inc.

Request for: \$490,000; Total Project Costs: \$8,716,523

Description of the Project: Alstom Power Inc. proposes to test an oxy-combustion system for tangentially-fired boilers while firing partially dried North Dakota lignite. The basic concept of oxy-combustion is to replace combustion air with a mixture of oxygen and recycled flue gas, creating a high CO₂ content flue gas stream that can be more simply processed for CO₂ capture and storage.

Technical Peer Reviewer Comments

Peer Reviewer 09-10

The scale of this work is still quite small (<50 M th) relative to commercial scale boilers. In the opinion of many, this technology is one of the leaders for use in utility scale commercial boilers in a future where CO₂ emissions will be constrained.

Recommendation: Fund

Peer Reviewer 09-11

Major challenges for lignite include moisture and sodium content. The moisture content is being addressed by testing partially dried lignite. Comparison of the results of testing to run-of-mine is unclear. The fate and behavior of high sodium containing lignite will not be adequately addressed. This project will provide some of the key data needed for the use of ND lignite in oxy-fired systems.

Recommendation: Fund

Peer Reviewer 09-12

It is not clear how the testing addresses the bottom line (economics) and mercury capture technology performance. The proposal states that Alstom can go from this testing to designing a commercial system. As such, one would assume that the costs and impacts on COE would result from this work.

Recommendation: Fund

Technical Advisor’s Recommendation: FUND

Carbon capture and storage may represent the largest long-term challenge to the lignite industry. Carbon capture may be accomplished either pre-combustion (i.e. IGCC), during combustion (oxy-combustion) or post-combustion (i.e. MEA solvents). Program studies are ongoing in the areas of pre- and post-combustion. This is an excellent opportunity to advance the oxy-combustion technology for ND lignite.

Conflict of Interest: Great River Energy; EERC