Grant Round Application for LRC-LXVI (66)

TECHNICAL ADVISOR COMMENTS
LRC-LXVI (66) – B

"Application of Waste Heat Recovery Generation at Great River Energy's Coal Creek Station "
Submitted by: Calnetix, Inc.
Request for: $330,000 (Step 1: $80,000; Step 2: $250,000); Total Project Costs: $896,745
Project Manager: Shamim Imani; Project Duration: 22 Months

Description of the Project: Step 1: Calnetix, together with Great River Energy and HDR Engineering, proposes to identify usable low temperature waste heat sources within a lignite power plant, and validate that sufficient usable waste heat exists, and can be accessed, from one or more of these sources to power multiple Calnetix's planned 1-2 MWe units. Step 2: Then a Calnetix WHG 100 would be installed at one such heat source and a demonstration conducted to determine the feasibility of generating electricity from it.

Technical Peer Reviewers' Key Comments:

All Reviewers
- The project goals/objectives are consistent with the NDIC goals/objectives;
- Objectives: likely achievable (1 reviewer); most likely achievable (2 reviewers);
- The background of the investigator(s) is: average (1 reviewer); better than average (2 reviewers);
- Scientific contribution is: significant (2 reviewers); very significant (1 reviewer);
- Project plan is: adequate (1 reviewer); very good (2 reviewers);
- Proposed budget value is: low value (1 reviewer); average value (2 reviewers)

Reviewer 09-4
This project appears to be worthy of funding. However, does the lack of financial commitment from industry imply the project lacks sufficient return on investment? If this project received cash financial contribution from industry, then this project would be recommended for funding. **Recommendation: Funding may be considered**

Reviewer 09-5
If successful, the overall efficiency and electricity output would be increased with additional benefits of reducing emissions (including CO2) and increase the competitiveness of lignite. The proposed project would be conducted at the Coal Creek Station. If successful, the thermal efficiency would be increased, thus providing a more economical plant. The new technology would also be applicable to the entire ND lignite industry. **Recommendation: F und**

Reviewer 09-6
Too many generalities without referenced backup. For example, Calnetix states that their 100kWe waste heat generator is superior to their competitors with respect to conversion of waste heat to electricity without supporting data. Similarly, there should be a justification as to why they are assuming that 10% of the waste heat from a power plant can be utilized. Calnetix states that their 1-2 MWe units can be scaled-up from their 100kWe units. This is an increase of 10-20 times the current size. No comments are made if this increase is considered an easy one or if they have concerns. If the installed cost of the small unit is $2500/kWe, why is the larger unit's installed cost the same? Wouldn't the cost be less expensive due to economies of scale? **Recommendation: Funding may be considered**

Technical Advisor's Recommendation: Fund (Demonstration project funds)
The applicant has attempted to address the peer reviewers' comments. This project has the potential to increase the overall efficiency of the Coal Creek Station by approximately 2.5% and this technology would be applicable to other lignite-fired power plants. Such an efficiency gain would be very significant. Should the Lignite Research Council recommend funding for this project, the following contingency should be included:
- NDIC funds would not be disbursed for Step 2, unless Calnetix receives the DOE funding referenced in the application.

Conflict of Interest: Great River Energy