

R007-A: "Dakota Turbines"  
Submitted by Posilock Puller Inc.  
Principal Investigator: Cris Somerville  
Request for \$178,500; Total Project Costs \$497,000

**Technical Advisor Comments**

- One reviewer recommended fund, two recommended funding may be considered.
- Applicants will provide a 64% match.
- 2 reviewers questioned the benefits of the in-house manufacture of an inverter compared to utilizing commercially available inverters. The applicants state that there was not a single phase inverter available and that it is financially advantageous to manufacture their own.
- 2 reviewers were concerned about the claim of achieving 85% efficiency as the theoretical maximum efficiency is 59%. The applicants have clarified that the claims of 63% efficiency of the current blades and 85% efficiency of the new design are percentages of the 59.3% available power under Betz Law.
- All 3 reviewers noted a lack of detail. The applicant stated it was not possible to provide enough detail on 10 pages. However, the applicant was never tied to 10 pages. Commerce requested more information multiple times.
- All 3 reviewers felt that the timetable was aggressive. The applicants agree, but state they will do everything in their power to stay on schedule.
- 1 reviewer wanted documentation to verify the claim of \$.07/KWH electricity.
- 1 reviewer was concerned with the methodology of moving from hand-wired boards to printed circuits stating that "...The use of hand-wired boards at this stage of the design suggests a lack of understanding about the electrical system, and that an inefficient, guess-n-check, approach is being used instead." While the applicants state that this is a misunderstanding and the final product will not utilize a hand-wired board, the reviewer feels that printed circuits should be utilized at all stages.
- All 3 reviewers felt that the project, if successful, could benefit North Dakota.

**Technical Advisor Recommendations**

Funding may be considered. There are some concerns with this proposal including:

- 1.) The Small Wind Turbine Protocols that the applicant relies on heavily in the proposal have not yet been approved. Protocols will be approved by the Small Wind Certification Council. This could have potential implications for both the timetable and budget of the project. The website currently states that they expect to begin accepting applications for certification in early 2010.
- 2.) Two reviewers questioned the applicability of developing a new inverter. It represents \$21,500 of the budget costs and 2 months of the 18 month timetable.
- 3.) All 3 reviewers felt there was a lack of detail in the proposal. Documentation to verify the claim of \$.07/KWH would strengthen the proposal.

An appealing aspect of this proposal is that it comes from the private sector with a 50% cash match, and a 64% match with in-kind contributions. It could make small wind more affordable and accessible. The project also has the potential to build industry in North Dakota.

If the award is granted, the Technical Advisor advises the following contingencies:

- The applicant agrees to provide progress reports and/or tours of the facility to the Council at its request.
- Industrial Commission and the Renewable Energy Program will receive recognition in all literature, and other project related public relation efforts with the following reference: Funded in part by the North Dakota Industrial Commission Renewable Energy Program.
- The project data and reports shall be provided to the Department of Commerce & Renewable Energy Council in both electronic and hard-copy formats with permission for unrestricted distribution. The electronic versions shall be in a suitable format for hosting on the Department of Commerce and Renewable Energy Council web sites.