

# TECHNICAL REVIEWERS' RATING SUMMARY

R002-A

## Small Wind Turbine Training Center

Submitted by Energy & Environmental Research Center

Principal Investigators: Bradley Stevens

Request for \$50,000; Total Project Costs \$100,000

| <u>Rating Category</u>        | <u>Weighting Factor</u> | <u>Technical Reviewer</u> |           |           | <u>Average Weighted Score</u> |
|-------------------------------|-------------------------|---------------------------|-----------|-----------|-------------------------------|
|                               |                         | <u>2D</u>                 | <u>2F</u> | <u>2G</u> |                               |
| Objectives                    | 9                       | 4                         | 2         | 4         | 30.00                         |
| Achievability                 | 9                       | 5                         | 4         | 5         | 42.00                         |
| Methodology                   | 7                       | 3                         | 3         | 3         | 21.00                         |
| Contribution                  | 7                       | 4                         | 2         | 3         | 21.00                         |
| Awareness                     | 5                       | 5                         | 4         | 4         | 21.67                         |
| Background                    | 5                       | 5                         | 4         | 3         | 20.00                         |
| Project Management            | 2                       | 4                         | 2         | 2         | 5.33                          |
| Equipment Purchase            | 2                       | 3                         | 2         | 2         | 4.67                          |
| Facilities                    | 2                       | 4                         | 3         | 3         | 6.67                          |
| Budget                        | 2                       | 4                         | 2         | 3         | 6.00                          |
| <b>Average Weighted Score</b> |                         | 210                       | 147       | 178       | <b>178.33</b>                 |
| <b>Maximum Weighted Score</b> |                         |                           |           |           | <b>250.00</b>                 |

### OVERALL RECOMMENDATION

|                           |   |   |
|---------------------------|---|---|
| FUND                      | x | x |
| FUNDING MAY BE CONSIDERED |   |   |
| DO NOT FUND               | x |   |

R002-A  
Small Wind Turbine Training Center  
Submitted by Energy & Environmental Research Center  
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- 1. The objectives or goals of the proposed project with respect to clarity and consistency with North Dakota Industrial Commission/Renewable Energy Council goals are: 1 – very unclear; 2 – unclear; 3 – clear; 4 – very clear; or 5 – exceptionally clear.**

Reviewer 2D (Rating:4)

The goals of the project match perfectly with both the mission statement and goals of the North Dakota Industrial Commission Renewable Energy Council. Specifically, the project will conduct research and education to promote the growth of North Dakota's renewable energy industry. The goals of the project also match the goal of the Commission in that it will promote public awareness and encourage the use of renewables.

Reviewer 2F (Rating: 2)

The proposal appears to be weak as far as meeting the goals and objectives of the Renewable Energy Council. Under "grant priority" goals and objectives, the only two that appear to be partially addressed are: "Most effectively educate the general public..." and "Develop baseline information that will lead..." But even these two goals and objectives are inadequately addressed. The proposal does not make a strong case for the need of a small wind education and training center, especially considering that North Dakota has very little activity with small wind system installations. The proposal mentions monitoring the performance of the two wind turbines to be installed and conducting technical workshops, but it is unclear who the participants would be.

Reviewer 2G (Rating: 4)

A small wind training center would clearly be consistent with the program goals of the NDICREC.

- 2. With the approach suggested and time and budget available, the objectives are: 1 – not achievable; 2 – possibly achievable; 3 – likely achievable; 4 – most likely achievable; or 5 – certainly achievable.**

Reviewer 2D (Rating: 5)

The proposal is over one year in length with a personnel budget in excess of 600 manhours. This certainly can be achieved within the suggested personnel allocation. From the budget information provided, I would expect that the proposal will indeed meet the goals of the project.

Reviewer 2F (Rating: 4)

The objectives are certainly achievable, partly because they are not very ambitious. An overriding concern with the proposal is that the EERC was already funded by DOE to

accomplish the stated project and objectives. The need for additional funding is not clearly stated and there doesn't appear to be much in the way of additional activity planned with the \$50,000 sought from the Renewable Energy Fund.

Reviewer 2G (Rating: 5)

The project goals are certainly achievable the funding and timetable given.

- 3. The quality of the methodology displayed in the proposal is: 1 – well below average; 2 – below average; 3 – average; 4 – above average; or 5 – well above average.**

Reviewer 2D (Rating: 3)

The methodology within the proposal seems to be lacking in specificity. Although there was an educational arm within the proposal, there were not exact details on how or when or with whom that was going to be accomplished. Nor were there particulars on installation versus operation versus maintenance within the proposal.

Reviewer 2F (Rating: 3)

There isn't much to go on here. The proposal talks about the equipment and site selection and installation methodology, but doesn't provide any real detail on the education and outreach efforts planned. It basically states that two small turbines will be purchased and installed at a location on the outskirts of Grand Forks and that the turbines will be used for education and training purposes, along with performance monitoring and evaluation. More of a case should have been made on the need for such a center and exactly who will be involved with the technical workshops and educational events. Again, there is no data provided on the small wind activity in North Dakota and the surrounding region, so it is difficult to accept that this proposed project addresses a significant renewable energy need.

Reviewer 2G (Rating: 3)

No addt'l comment.

- 4. The scientific and/or technical contribution of the proposed work to specifically address North Dakota Industrial Commission/Renewable Energy Council goals will likely be: 1 – extremely small; 2 – small; 3 – significant; 4 – very significant; or 5 – extremely significant.**

Reviewer 2D (Rating: 4)

The project as proposed, will meet a number of the North Dakota Industrial Commission Renewable Energy Councils goals from the technology standpoint. I would suggest that the monthly reporting specified within the proposal for the first operational year include information to include performance data with an economic analysis which includes capital and maintenance expenses.

Reviewer 2F (Rating: 2)

It is difficult to see how this project will lead to new jobs, wealth, and tax revenue; preserve existing jobs; bring new companies or investment to the state, etc. As stated previously, more of a case needs to be made on the need for this small wind center.

Reviewer 2G (Rating: 3)

Deployment of small wind technology in North Dakota will have a number of spin-offs including the development of cottage industry and positive impacts for wind energy in general.

- 5. The principal investigator's awareness of current research activity and published literature as evidenced by literature referenced and its interpretation and by the reference to unpublished research related to the proposal is: 1 – very limited; 2 – limited; 3 – adequate; 4 – better than average; or 5 – exceptional.**

Reviewer 2D (Rating: 5)

The principal investigator appears to have a good handle on information from the industry as well as research data from the EERC.

Reviewer 2F (Rating: 4)

There is really no mention of current research activity and published literature, unpublished research, etc. related to small wind energy. The principal investigator has a strong background in wind energy and wind monitoring programs and is well qualified to oversee a project of this scope.

Reviewer 2G (Rating: 4)

P.I clearly has experience and knowledge of the wind industry and current state of technology.

- 6. The background of the investigator(s) as related to the proposed work is: 1 – very limited; 2 – limited; 3 – adequate; 4 – better than average; or 5 – exceptional.**

Reviewer 2D (Rating: 5)

As the project is both research and educational, the principal investigator as well as staff available should have an excellent background for success of this project.

Reviewer 2F (Rating: 4)

As stated above, the principal investigator and the personnel at the EERC are well qualified for the proposed work. However, the proposal needs to provide better information on the nature of proposed technical training and educational efforts relative to the center.

Reviewer 2G (Rating: 3)

Small turbines are unique in the way they operate and in maintenance requirements which can only be learned by doing. Experience comes with time spent working with the turbines, which it doesn't appear that the Investigators have at this time.

- 7. The project management plan, including a well-defined milestone chart, schedule, financial plan, and plan for communications among the investigators and subcontractors, if any, is: 1 – very inadequate; 2 – inadequate; 3 – adequate; 4 – very good; or 5 – exceptionally good.**

Reviewer 2D (Rating: 4)

The management plan seems to be concise and well within reason with the principal investigator taking the lead. The timeline given should allow sufficient management oversight.

Reviewer 2F (Rating: 2)

The project schedule is for a one-year period and there is no further detail provided as far as milestones, etc. The financial budget indicates that the \$50,000 already received from DOE will be used for equipment and the \$50,000 from the NDREF will be used for personnel costs and overhead.

Reviewer 2G (Rating: 2)

Could use a more detailed schedule.

- 8. The proposed purchase of equipment is: 1 – extremely poorly justified; 2 – poorly justified; 3 – justified; 4 – well justified; or 5 – extremely well justified. (Circle 5 if no equipment is to be purchased.)**

Reviewer 2D (Rating: 3)

The project will not be purchasing additional equipment as it is proposing to utilize DOE purchased equipment as well as possibly utilize an existing wind monitoring system that is currently in the EERC's possession. I would encourage the project to indeed include such a monitoring system and include such performance information analysis in the monthly reporting requirement. It was indicated that there is a possibility of an educational kiosk which should also be considered.

Reviewer 2F (Rating: 2)

It is unclear why the specific turbines were chosen for purchase and installation. The sizes of the two turbines (4.25 and 1.8kW) are quite small, and may not be representative of the size turbines typically installed in rural, farm settings. It must be assumed that DOE was okay with the selection, since they provided the funding for the original project.

Reviewer 2G (Rating: 2)

No itemized equipment list.

- 9. The facilities and equipment available and to be purchased for the proposed research are: 1 – very inadequate; 2 – inadequate; 3 – adequate; 4 – notably good; or 5 – exceptionally good.**

Reviewer 2D (Rating:4)

The proposal has selected two wind generators of sufficient differentiation that research on the comparability of such should be valuable.

Reviewer 2F (Rating: 3)

It's not clear that there is any proposed research other than performance monitoring of the equipment. See comments under #8 above. There is brief mention of possible research related to blade modifications.

Reviewer 2G (Rating: 3)

The proposed turbines should serve as a good teaching-demonstration platform.

**10. The proposed budget “value” relative to the outlined work and the financial commitment from other sources is of: 1 – very low value; 2 – low value; 3 – average value; 4 – high value; or 5 – very high value. (See below)**

Reviewer 2D (Rating: 4)

The research and education proposed within this project should have substantial value to the general public. The cost of such appears to be within that which would be expected for such a successful project.

Reviewer 2F (Rating: 2)

The overriding concern with this proposal is that it has already been funded by DOE. There simply isn't sufficient justification for the need of additional funding in the amount of \$50,000 from the ND Renewable Energy Fund. In fact at one point the proposal states “The existing DOE project currently has funds in excess of \$50,000, but...” It seems from this statement that the NDREF dollars would supplant already approved DOE dollars. Another concern is that all the existing and proposed funding is either from federal or state government sources; there is no funding from private industry. If private industry were engaged in the proposal, with funding and with technical and educational participation, it would be easier to justify the use of state funds.

Reviewer 2G (Rating: 3)

Costs do not seem out of line for the scope.

Financial commitment from other sources – A minimum of 50% of the total project must come from other sources to meet the program guidelines. Higher priority is to be given if the application has private industry investment equal to or at least 50% or more of total cost.

The minimum 50% cash match is demonstrated.

### **Section C. Overall Comments and Recommendations:**

**Please comment in a general way about the merits and flaws of the proposed project and make a recommendation whether or not to fund.**

#### **Reviewer 2D (Fund)**

I believe the proposal falls well within the goals of the North Dakota Industrial Commission Renewable Energy Council. I would encourage the council to include wind measurements for performance analysis as well as an economic analysis within the reporting guidelines as this must be part of a complete educational process.

#### **Reviewer 2F (Do Not Fund)**

I do not recommend funding of this proposal for several reasons:

- DOE has already provided funding for the Center and the technical and educational training, and there doesn't appear to be any significant enhancements that would result from the additional \$50,000 in state money;
- The proposal really doesn't address the priority goals and objectives of the Renewable Energy Council and Fund;
- There isn't an adequate case made for the need of such a Center, especially considering the apparent lack of small wind activity in North Dakota. North Dakota does not have net metering in place except for the investor-owned utilities which, for the most part, do not serve the rural areas. In addition, there are no real state incentives in place for small wind systems (the tax incentives are only available on the "long" form, which few use). So until these scenarios change, and there is an upturn in activity, it is hard to justify the need for a small wind center; and
- There is no private industry involvement.

#### **Reviewer 2G (Fund)**

Proposal could have provided more detail, but in general, this project would add value and further the states goals of promoting and fostering small wind.