Minutes of the

RENEWABLE ENERGY COUNCIL

Monday, December 7, 2009
NDSU Alumni Center – Stenehjem Room
1241 N. University Drive, Fargo

CALL TO ORDER

Shane Goettle, Chairman, called the Renewable Energy Council meeting to order at 11:04 am.

Members Present: Shane Goettle, Al Christianson, Eric Mack, Terry Goerger, Mark Nisbet, Randy Schneider, and Rod Holth.

Others Present:
Andrea Pfennig, Department of Commerce
Karlene Fine, Industrial Commission
Joleen Leier, Department of Commerce
Brian Koski, Wanzek Construction
Don Hochhalter, Wanzek Construction
Sandra Broekema, Great River Energy
Todd McDonald, Prairie Public Broadcasting
Keith Monson, Posilock Puller Inc.
Cris Somerville, Posilock Puller Inc.
Maynard Helgaas, Green Vision Group
Jocie Izler, Jocie Izler Consulting
Patrice Lahlum, Consultant for Great Plains Institute
Nancy Hodur, North Dakota State University
Larry Lestritz, North Dakota State University
Donald Senedul, The Windmill Group, LLC

WELCOME

Shane Goettle welcomed everyone to the Renewable Energy Council.

APPROVAL OF MINUTES

September 21, 2009 meeting minutes were reviewed.

Randy Schneider moved to approve the minutes. Al Christianson seconded the motion. Motion passed.

PRESENTATION OF FINANCIAL SUMMARIES

Fine reviewed balance of funds. There is currently $3,103,603.18 available for this grant round. The cash balance is $5.4 million and the balance of outstanding administrative commitments is $90,000.

CONSIDERATION OF GRANT ROUND 7 APPLICATIONS

R007-A: "Dakota Turbines"; Submitted by Posilock Puller Inc.; Principal Investigator: Cris Somerville; Project Duration: 18 months; total Project Costs: $497,000; Request for: $178,500

Pfennig gave an overview of the project. The overall reviewers' recommendations follow: Fund (193) and Funding May Be Considered (155) & (182). The average weighted score is 176.67 out of 250.00.

The Department of Commerce made the following recommendations:

- Funding may be considered.
- Some concerns with the proposal include:
  - 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.
  - 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.
  - 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.

- 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.
- The following are suggested contingencies if funded: 1) The applicant agrees to provide progress reports and/or tours of the facility to the Council at their request, 2) NDIC will receive recognition in all project related public relation efforts with the following reference: a) Funded in part by the North Dakota Industrial Commission Renewable Energy Program, 3) Project data and reports shall be provided to the NDIC & Commerce 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.

Keith Monson and Cris Somerville presented for Posilock.

In response to question from Goerger, Monson stated the inverter will not affect timeline. If not UL listed, they can sell it. Insurance companies are the only ones concerned about the UL listing. Somerville commented that it isn't necessary to have the UL approval; there are more options out there rather than UL.

In response to question from Nisbet, definition of "small" wind is anything under 100 kilowatts. Anything under 5 is micro. Our turbine, at 5 kw, could handle the whole length of shop. How many sizes do you envision? Our turbine is scalable from 5-100. We simply make the discs bigger and that will change the kilowatts. This is all done on the same axel.

In response to question from Goettle, Monson commented that they cannot tell which is the best in the market right now. The whole key to this is going to be the Small Wind Certification Council.

In response to question from Schneider, what is going to set us apart from everyone else? Most turbines can't kick in until 7-8 mph and produce very little electricity. We can start spinning at 0 mph. They are getting 20% out of the wind; we are getting 50-60%. The average is low 40s.

In response to question from Schneider, (we produce electricity with lower wind speeds). Is higher wind speed a detriment to you? No, we're getting more power out of every wind speed. Somerville commented that the misconception is if the turbine is spinning there's a lot of power. Not true, if you double the wind speed you have more power. We can produce at 2 mph wind speed. This is most important for low wind areas. We have a wind machine that can operate from a low wind speed to a very high wind speed. The range is wider, but efficiencies are even greater.

In response to question from Schneider, previously had an anemometer on both front and back. This was initially how we were going to control the turbine. Having it on the front caused issues. It is now going to be located 26 feet below the turbine on the side of the tower (still attached to the tower). Barometric pressure will not affect wind speed, has to do with density. The anemometer being located further down will not affect the calibration of the wind speed.

In response to question from Schneider, who is your marketplace and what authorities you will have to deal with to get these up? Can sell these in the Midwest for 20 years before we run out of customers. Farmers and small businesses will be our target. The other thing we're trying to do is put it a half mile down the road where there is nothing. We'll buy the transformer and pay the service fee for the meter. It's to everybody's benefit to get the most out of that meter. Right now, we can't get this done.

In response to question from Schneider, is it possible and conceivable to do this with the towers that are currently out there? No. Currently what we have out there is 1.5 million kw. Blades on ours are 35 feet in diameter. Can scale 5-100 kw.

In response to question from Schneider, clarify who you are working with. Dealing with several companies. Henry VonBank educated in

electrical engineering, software major. Working with him for a better part of a year regarding Hosig software.

In response to question from Schneider, what size turbine would you need on a typical farm? In ND, a typical farm with bins and dryers, 80% of electrical use is compressed into four months. During those four months the turbine isn't going to touch it. During the other eight months he is going to exceed the usage, so you will get the offset price rather than the retail price. If metering would be billed once a year, we would be small. We would get retail price for everything. Wind turbines put out a lot more energy in the winter than in the summer.

In response to question from Schneider, what is Nodak's receptivity to what you are doing. It is absolutely excellent. The people from Nodak are excited about it. Also been working with Ottertail; they are equally excited. Utilities seem to be afraid of renewable energy. This doesn't seem to be the case anymore.

In response to question from Goerger, what is the height? 35 kw tower is 80 feet. At Chris' place, it should be 100 feet to clear trees (tower has trees on three sides). Somerville commented you can add a lot of expense to the tower to get addition feet, however, but will the returns pay off. An 80-foot tower located in the correct position, would be sufficient.

In response to question from Goerger, 50 mph wind, not able to determine what efficiency is. Shedding so much power that your efficiency is down. Pitch out of the wind at this point. Don't know if we need to shut them down at high wind speeds, we can turn the turbine. Right now they feel comfortable that a 35 foot blades on 35 kw and 80 feet tower placed in right spot would be sufficient.

In response to question from Mack, Monson stated that they don't have any surveys to see the market available. Best payback was in 28 years.

Nisbet commented that the economics haven't been there yet. Not a lot of work has been done yet with the utilities, since it isn't an economical option yet.

Somerville commented that initial goal was to have the most economic wind turbine available, we're almost there. Next is to keep it economical. We have been subcontracting the blades out; we want to bring that back in-house. We want to manufacture all the components. We will make money on a manufactured system, not components. This will give us a huge leg up.

In response to question from Georger, are you doing basic research and also converting technology you have into commercialization? At the same time will you be doing some basic research hoping to convert it into commercialization? Somerville stated that is correct. Goal in 18 months is to be certified.

In response to question from Goettle, 18-month timeline, what is the biggest barrier? On the inverter side, UL is a mess. On the turbine side, don't see anything that would stop us unless there would be a major mechanical flaw. Duration and fatigue issues could possibly be a problem. Have not had any mechanical issues to date.

In response to question from Schneider, is there a reason you put the first one with trees around three sides of it? Yes, he lives there. Sample site with trees on three sides is for a safe, controlled site with handling benefits. Old blades you can't hear, new blades whistle.

In response to question from Nisbet, if you get into production and you find the right product, would you view be to sell to match the loads of the residence? When you say Ottertail has any interest, is it to add more renewable to the grid? What would be the model for adding wind on farms and rural residences? Typically you want to be a little less than what their load is so you offset retail. I don't think Ottertail for Nodak see us as a threat yet. I think distributed wind is the final solution. Somerville stated, ultimately, I can dream of a day where the utilities help their customers get into wind turbines to strengthen their weakening electrical grids on the outside feeder lines. It puts more renewables on their systems and keeps their customers happy.

COMPLETION OF BALLOT

R007-A: "Dakota Turbines"; Submitted by Posilock Puller Inc.
Fund: 7 **Do Not Fund:** 0

PROGRESS REPORTS FROM CURRENT PROJECTS

Developing a Biomaterials Industry in ND

Larry Lestritz introduced colleagues (Nancy Hodur and Don Senechal) then proceeded to give an update on their progress.

In response to question from Schneider, batch processing or continuous process, commercial facility needs the continuous process. Still working on different concepts on how to get the biomass into the reactor.

In response to question from Schneider, interested in higher value coproducts.

Feasibility Study of a Biomass Supply for the Spiritwood Industrial Park

Sandra Broekema with Great River Energy presented update for Spiritwood Industrial Park.

In response to questions from Schneider, we will take approximately 2/3 of crop residues off, we will not take 100% off. 10,000 acres in a 50-mile radius seems very doable.

In response to questions from Schneider, did you look at barley straw, flax straw, or any other commodities? Broekema stated there wasn't a sufficient quantity within the 50-mile radius of Sprit Wood to take a detailed look at that. They at wheat straw, corn stofer and cobs, and dedicated energy crops. It is somewhat site specific.

In response to questions from Mack, ground is the most economical way to go at this time versus palletizing. At a minimum it needs to be ground to co-feed.

In response to questions from Goettle, their consumed price is $3.50.

In response to questions from Nisbet, we're about two years away from advertising Biomass.

In response to questions from Christianson, went to Denmark to look at technology. They use taller varieties of wheat straw than we do in ND. Denmark pulls in larger radius than we do.

Consideration of Motion (Roll Call Vote) to close Meeting for Discussion of Confidential Project (Pursuant to NDCC 54-63-02).

It was moved by Schneider and seconded by Goerger that the Renewable Energy Council meeting be closed to receive a progress report on the Biomass Enhanced Refined Lignite Demonstration Project which has been determined to be confidential pursuant to North Dakota Century Code 54-63-02. The report includes a tour of ComPAKco facilities. Motion passed.

Meeting was closed at approximately 1:33 pm.

It was moved by Goerger and seconded by Mack to reopen the meeting. Motion passed

The meeting was reopened at 1:34 pm.

ADJOURNMENT

It was moved by Schneider to adjourn the meeting upon completion of the tour of ComPAKco. The motion was seconded by Nisbet and carried on a voice vote that the meeting would be adjourned upon completion of the tour.

The next meeting will be held in March or April.

Schneider moved to reclose meeting, Mack seconded the motion. Motion passed.

Shane Goettle Date
Chairman

Joleen Leier Date
Acting Recorder