Minutes of the

RENEWABLE ENERGY COUNCIL

Wednesday, April 7, 2010
Great River Energy – Fort Union Room
1611 East Century Avenue, Bismarck

CALL TO ORDER

Shane Goettle, Chairman, called the Renewable Energy Council meeting to order at 10:30 am.

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

Members Absent: Eric Mack and Terry Goerger.

Others Present:
Andrea Pfennig, Department of Commerce
Karlene Fine, Industrial Commission
Joleen Leier, Department of Commerce
Richard Poulden, Sirius Exploration/Dakota Salts
J.T. Starzecki, Dakota Salts
Sean Wright, E.P.R.I.
Ted Pagano, Dakota Salts
Dr. Stelios Arvelakis, EERC
Cole Gustafson, NDSU
Craig Talley, Betaseed, Inc.
Igathi Cannayen, NDSU
Maynard Helgaas, Green Vision Groups
Rick Whittaker, HRE
Trent Winnr, HRE
Milton Lindvig, ND Irrigation Association
Blaine Schatz, NDSU: CREC
Orville Tranby, Cooperstown EDC
Rudy Rachhe, Fargo, ND
Timothy Maller, NDSU Mandan
Cal Thorson, USDA-ARS, Mandan
Becky Meidinger, Cooperstown/Griggs County EDC
Lloyd Anderson, GVG
Chad Wocken, EERC

WELCOME

Shane Goettle welcomed everyone to the Renewable Energy Council meeting.

APPROVAL OF MINUTES

December 7, 2009 meeting minutes were reviewed.

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

PRESENTATION OF FINANCIAL SUMMARIES

Fine distributed a packet which included the financial summary and the technical advisors recommendation for each project that will be reviewed today. There is currently $3.1 million available for this grant round and subsequent grant rounds.

Last biennium Renewable Energy and Biomass were two side-by-side programs being operated by the same commission. We thought it was best policy wise to combine these programs and funds. This is where the funds entitled "Revenue from the Biomass Incentive Research Fund" originated.

Conflict of Interest forms were completed and submitted.

CONSIDERATION OF GRANT ROUND 8 APPLICATIONS

R008-A: "Bulk Energy Storage for ND Wind Integration"; Submitted by Dakota Salts; Principal Investigator: Dakota Salts, LLC, Electric Power & Research Institute, Schlumberger, Tetra Tech; Project Duration: 8 months; Total Project Costs: $570,000; Request for: $225,000

Pfennig gave an overview of the project. The overall reviewers' recommendations follow: Fund (165 & 202) and Funding May Be Considered (170). Average Weighted Score was 179 out of 250. Commerce's recommendation is to fund this project.

J.T. Starzecki presented.

Christianson commented on the historical data versus future data. He suggested utilizing data from 2008 as well.

Goettle clarified if they primarily would operate the plant during peak times, so peak market would be your market? Reply: You will offset combustion turbines (CTs). If you don't have storage you will have more and more CTs that are peaking to meet the peak load. As you look at the demand over those three years, is the driver the peak load? Reply: Actually it's going to operate like an intermediate duty plant. It will be operating a lot more than CT. Capacity factor would be 30-40 percent. Nisbet commented it depends on how they gauge this as far as a renewable energy source. With our 30 percent requirement can you count the wind that has been put in to storage; also to reduce how many turbines to still reach 30 percent? Starzecki stated you can time shift as well. It will cycle more than one time a day. It will ramp up and down quickly. It can act as a controllable load. It will operate as a generator and as a load.

Nisbet asked how close to the wind field are they typically placed. Will you build wind around the caverns or put the caverns close to the wind? Reply: It depends on transmission congestion. You may do it near a bottleneck. You don't have to have it at a wind plant and typically you wouldn't want to do that. You want to service the grid. There are services to be provided to the grid and the wind will cause its own challenges. It doesn't need to be associated with a wind farm.

Goettle clarified you become a consumer of electricity at night when wind is blowing strong and become a generator during peak? Reply: Yes, that is correct. You act as a flexible generator which is good for the system and a very flexible load.

Holth asked where else in the state would you be looking at for a plant other than Burke County. Reply: One-third of the state has underlying salt. The most advantageous areas for potash and salts extend all the way into Bottineau County and Ward County. You can go farther into Williams and Divide Counties, but you have to go deeper.

Nisbet asked if potash needs to be removed before having storage space. Reply: Doesn't have to be in that order, but yes it would need to be removed.

Christianson asked if tailored collaboration money is involved. Starzecki said no.

Schneider asked if potash mining economically stands on its own. Reply: Yes, they are both standalone products.

Schneider asked how the caverns in Alabama were created. Reply: Solution mining. What have you learned from that that you can't use in ND? Reply: The salt domes are very pure salt. They are easy to solution mine and easy to control. Geological setting is much shallower in Alabama (2,000-3,000 ft.). In ND we'll need 6,000-5,000 ft. We're operating at much higher operating pressures because of the depth of salts.

Goettle asked, what is the status of your potential operations in ND for potash? If this wasn't approved you would still do potash mining in ND? Reply: Yes. Right now we've targeted up to 30,000 acres in Burke County. It's the tail end of Williston Basin. We've got a full land team based in Minot to secure necessary rights. We've applied for and expect the permitting process to come through shortly. We will then put the test cores down which will be complete by the end of August. If they come back the way we think they will, then we launch into a Pilot plant project. We'll invest $300-500 million to get a pilot plant up and running. We'll drop additional live wells down and continue to move the project along.

Goettle asked about average depth of potash in Burke County. Starzecki stated it starts at 5,500 and can go all the way down to about 8,000. Are you severing potash minerals from the oil? We go at least 1,500 below the Bakken and will deploy directional drilling. Leases are generally for oil, gas, and other minerals. Do you need to go back to company to get release for the potash? No. We haven't run into that. Leases are generally for oil and gas.

Burke County potash will be at 7,500-9,000 ft. Correctional drilling is going down 10,000 ft. in Mountrail County, as you progress towards the border it will be about 7,200 ft. It will be more difficult in Mountrail County because depths are much greater.

Nisbet asked who's based in North Dakota. Land team in Minot consists of three employees.

Goettle asked him to address transmission. Pumping renewable energy at nonpeak times. This is not an issue.

R008-E: "Development of Advanced Pretreatment Technologies for the Production of Clean Biocoal/Syncoal from Woody Biomass, Agricultural Residues, and Municipal Solid Waste"; Submitted by EERC; Principal Investigator: S. Arvelakis; Project Duration: 12 months; Total Project Costs: $1,432,047; Request for: $300,000

Pfennig gave an overview of the project. The overall reviewers' recommendations follow: Funding May Be Considered (179 & 155) and Do Not Fund (124). Average Weighted Score was 153 out of 250. Commerce's recommendation is to revise the proposal and resubmit in the next round. Suggested contingencies are:

1. Applicants provide revised milestones, and management plan.
2. Applicants provide a revised methodology.
3. Applicants provide more detail regarding the feedstocks that will be used, and quantities of each.

Dr. Stelios Arvelakis presented.

Goettle asked Dr. Arvelakis to expand on the following:

Applicants provide revised milestones and management plan. Arvelakis said he could provide that.

Goettle asked if they will be testing each of those feed stocks on the above list. Dr. Arvelakis stated "Yes, they will."

Goettle commented that he liked the good solid match.

Goettle asked if there are proposed contingencies:

1. **Applicants provide revised milestones and management plan.**

Al Christianson moved to add contingency #1 as stated above. Rod Holth seconded the motion. Motion passed.

2. Applicants provide revised methodology.

Commission didn't feel it was necessary to include this contingency.

3. **Applicants provide more detail regarding feed stocks that will be used and quantities of each.**

Al Christianson moved to add contingency #3 as stated above. Mark Nisbet seconded the motion. Motion passed.

R008-D: "Energy Beet Research"; Submitted by Green Vision Group; Principal Investigator: Maynard Helgaas; Project Duration: 2 years; Total Project Costs: $330,000; Request for: $165,500

Pfennig gave an overview of the project. The overall reviewers' recommendations follow: Funding May be Considered (145 and 189) and Do Not Fund (119). Average Weighted Score was 151 out of 250.
Commerce's recommendation is funding may be considered.

Maynard Helgaas presented.

Nisbet asked, where will the acres come from or what crop will farmers switch out of? Schatz responded, not any one crop will see a significant impact in terms of reduced acres, it will be a collective impact on diversified crops.

Schneider asked if the project in Iowa has return of investment of 37%. Helgaas stated that this is based on $1.84 ethanol. Schneider asked if they are undertaking the burn test to allow you to move up the rim energy chain. Helgaas replied, yes that is correct.

Schneider asked are you using patented technology or are you reinventing technology. We are using new technologies. They have done a tabletop test and the patent has been published.

They are currently removing the juice from the beets and trying to find a way to store the raw juice.

Schneider asked that with a 20 million gallon facility if they have determined the type of storage they will need for the juice. Helgaas stated approximately 3 million gallon storage tanks they would need to maintain.

Helgaas addressed the cited study that using refined sugar was not profitable. He agreed. They use sugar that is never used for consumption. The sugar they use is specifically made to make ethanol.

Helgaas explained that they use the Brazilian process to remove the yeast from the beets. Pull yeast off during fermentation process. The yeast is worth $500 a ton once dried. You would never use this to feed to animals.

Emphasized that this is a multiple feedstock energy plant.

R008-H: "Renewable Oil Refinery Pilot Plant Construction"; Submitted by EERC; Principal Investigator: C. Wocken; Project Duration: 18 months; Total Project Costs: $6,500,000; Request for: $500,000

Pfennig gave an overview of the project. The overall reviewers' recommendations follow: Fund (211 and 201) and Funding May be Considered (185). Average Weighted Score was 179 out of 250. Commerce's recommendation is to fund this project. Suggested contingencies follow:

1. A more detailed schedule and milestone chart is provided to the Council upon conclusion of the ongoing design efforts and prior to bid requests.
2. The remaining funding for the project must be secured by September 30th, 2010.
3. Feed stocks must be relevant to ND.

Chad Wocken presented.

Goettle pointed out to the Council has previously supported another associated project related to Crambe and Tesoro's potential use. Wocken stated the current proposal is Phase II.

Schneider asked if they would be able to live with what DARPA is offering cost wise. Wocken said he feels $.28/lb would work but he can't comment for certain.

Schneider asked if they are producing fuel? Yes, they are producing fuel, spec compliant jet and diesel fuel. What value does naptha has as a coproduct in this process? It will provide a blend stock to gasoline. Naptha makes up 10-15% of product that we make. You can use this in the plastics industry. Not likely to have a real high octane number, it might be neutral.

Holth asked if Blaine Schatz gave them an idea of pounds per acre. Yes, 18 lb crambe per acre = 15 million gallons for 200,000 acres.

Goettle asked about camelina. Wocken stated that it is a step ahead of crambe.

Wocken was asked by Goettle to expand on the concern of what they're looking for in a general contractor. Wocken stated there wasn't a lot of detail in the proposal. He stated they clearly need to check references. They rely on engineering firms to evaluate contractor's credentials and experience (pilot scale and small scale). Accelergy has met many of the engineering firms out there. They have assisted them quite a bit already. Don't have a definite plan yet. Site has been selected.

Christianson clarified production of 7 gallons of water for every 100 gallons of fuel (7%).

Schneider asked if you can adjust how much jet fuel and diesel fuel that you can produce. Wocken explained that is correct and gave an overview of the process. Schneider asked if they can adjust to the marketplace on demand and supply. Wocken replied, yes.

Nisbet questioned the economic viability and what is the critical element that must be accomplished. Wocken responded that they will produce jet diesel, depending on where you are will determine the market. Mandan can't sell jet fuel, California similar, Hawaii has a good demand for jet fuel. Therefore, it is somewhat market specific. One advantage of jet fuel at this time is that the Department of Defense procurement wants to

purchase large quantities of renewable jet fuel for a substantial price.

Schneider clarified that beginning in 2011 there is a carbon tax you will pay if flying into Europe and not using renewable jet fuel. When you land you will have to pay a tax. Is that correct? Wocken said he is not certain if that has passed yet, but has heard discussion on that topic.

Nisbet asked if there is a carbon reduction on this. Wocken is not certain.
Proposed Contingencies:

1. **A more detailed schedule and milestone chart is provided to the Council upon conclusion of the ongoing design efforts and prior to bid requests.**

Al Christianson moved to implement contingency #1 as stated above. Rod Holth seconded the motion. Motion passed.

2. **The remaining funding for the project must be secured by September 30, 2010.**

Al Christianson moved to include contingency #2 as stated above. Rod Holth seconded the motion. Motion passed.

3. **Feed stocks must be relevant to North Dakota and the project must take place in North Dakota.**

Mark Nisbet moved to include contingency #3 as revised above. Al Christianson seconded the motion. Motion passed.

<u>R008-G: "Biomass Testing Laboratory for Physical and Thermal Characteristics of ND Feedstock"</u>; Submitted by NDSU; Principal Investigator: C. Gustafson & I. Cannayen; Project Duration: 2 years; Total Project Costs: $567,022; Request for: $283,511

Pfennig gave an overview of the project. The overall reviewers' recommendations follow: Fund (207 and 204) and Funding May be Considered (180). Average Weighted Score was 197 out of 250. Commerce recommendation is funding may be considered. Suggested contingencies follow:

1. The applicants agree to send samples to outside labs to conduct analysis of replicate samples to validate performance of equipment, procedures, and technicians.
2. Applicants provide a plan detailing testing sample priority.

Cole Gustafson and Igathi Cannayen presented.

Goettle asked if this has been presented to SBARE (State Board of Agricultural Research Education). Gustafson said they have not presented; they missed the deadline. They will have to wait until the 2013 Legislative Session.

Schneider asked about the four pieces of equipment that were outlined in the proposal. Would these be sufficient for the crops discussed? Cannayen responded that this is what they see as the basic tests. Schneider asked if he feels the three pieces of machinery would do the necessary testing. Cannayen assured him they would cover everything.

Schneider commented that using those four pieces of machinery and making it as a profit center.

Christianson commented that he feels that the chemical part would be very helpful if it was a part of your operation rather than doing parts of the projects at different sites. Gustafson agreed.

Goettle discussed match. He stated that you can't match state money with state money. Gustafson pointed out that funding from other sponsors are coming from USDA (federal sources).

Goettle stated if the Council approves this application where is the private sector validation or investment in the project? Gustafson stated that some activities need to be done in advance of commercial development. This is one of those things is having market information and testing capabilities to facilitate development. There may be private sector firms that may be interested in doing this but in these recessionary times we've had trouble identifying them. Private match isn't easy to come by. Goettle stated that if the Council does approve this proposal, he will try to echo this response to the Industrial Commission.

USDA representative commented that one of the issues you will have to attract private investment in a new technology like biomass is they are looking to go to any area they can to reduce their risk because it is such a risky avenue of expansion. The more knowledge we have on resources we have available for them, the better they will be able to look at North Dakota as a less risk area to invest their capital in.

Proposed Contingencies:

1. Applicants agree to send samples to outside labs to conduct analysis of replicate samples to validate performance of equipment, procedures, and technicians. Council agreed not to include.

2. Plan detailing testing sample priority. Council agreed not to include.

Goettle asked for $283,000; have match for less than 50%.

Match dollars are coming in form of equipment and cash.

Randy Schneider moved that the Council fund the machinery only. Mark Nisbet seconded. Motion passed.

Contingency is to allow funding for the four pieces of equipment only outlined in the proposal in the amount of $225,000.

CONFLICT OF INTEREST

R008-A: "Bulk Energy Storage for ND Wind Integration"
- Mark Nisbet
- Al Christianson

R008-D: "Energy Beet Research"
- Rod Holth
- Al Christianson

R008-E: "Development of Advanced Pretreatment Technologies for the Production of Clean Biocoal/Syncoal from Woody Biomass, Agricultural Residues, and Municipal Solid Waste
- Al Christianson

R008-G: "Biomass Testing Laboratory for Physical and Thermal Characteristics of ND Feedstock
- Al Christianson
- Mark Nisbet

R008-H: "Renewable Oil Refinery Pilot Plant Construction"
- None

COMPLETION OF BALLOTS

R008-A: "Bulk Energy Storage for ND Wind Integration"; Submitted by Dakota Salts.
Fund: 4 **Do Not Fund:** 1

R008-D: "Energy Beet Research"; Submitted by Green Vision Group.
Fund: 4 **Do Not Fund:** 1

R008-E: "Development of Advanced Pretreatment Technologies for the Production of Clean Biocoal/Syncoal from Woody Biomass, Agricultural Residues, and Municipal Solid Waste"; Submitted by EERC.
Fund: 0 **Do Not Fund:** 5

R008-G: "Biomass Testing Laboratory for Physical and Thermal Characteristics of ND Feedstock"; Submitted by NDSU.
Fund: 5 **Do Not Fund:** 0

R008-H: "Renewable Oil Refinery Pilot Plant Construction"; Submitted by EERC.
Fund: 4 **Do Not Fund:** 1

ADMINISTRATIVE BUSINESS

Difficulties of State Institutions in Finding Match

Goettle explained that the Council has received correspondence complaining that this program isn't working well. There are state institutions that are trying very hard to find private sector partners and are unable to. Pfennig informed the Council that Dr. Gustafson stated he had to withdraw a proposal because of lack of match; since our policy is that you can't match state with state funds. He wanted the Council to be aware of how difficult it is for a state agency to find matched funding.

Christianson stated that he feels the economy is one of the reasons this is happening. A lot of the people that have the big research development budgets have funded way to much research and haven't gotten much development. People are tired of

paying for the salaries of people to do research for research sake. It's that mentality that has moved to the forefront. Companies are sticking to core business more than ever before.

Goettle stated that we have just authorized approximately $1 million funding in this round. He feels there is sufficient demand.

The Council agreed that businesses need to bring credible projects to the table with private sector funding.

Other Business

The next meeting will be in August.

ADJOURNMENT

It was moved by Randy Schneider to adjourn the meeting. The motion was seconded by Rod Holth. The meeting was adjourned at 3:24 pm.

Shane Goettle Date
Chairman

Joleen Leier Date
Acting Recorder