Minutes of the
RENEWABLE ENERGY COUNCIL
Wednesday, October 10, 2018
1:30 p.m. (CDT)
Icelandic Room
North Dakota Department of Commerce
Bismarck, ND

CALL TO ORDER

Members Present: Shawn Kessel, Al Christianson, David Douglas (phone), Randy Schneider, Rod Holth, Terry Goerger (phone), Mark Nisbet

Others Present:
Andrea Pfennig, ND Industrial Commission
Karlene Fine, ND Industrial Commission
Denise Faber, ND Department of Commerce
Bonnie Malo, ND Department of Commerce
Sandi Piatz, Microsoft
John Flory, eSmart Systems
Terry Sando, eSmart Systems
Mike Williams, Fargo Parking Commission
Tim Conmy, Border States Electric
Dustin Willet, Red Trail Energy LLC
Gerald Bachmeier, Red Trail Energy LLC
Charles Gorecki, UND EERC
Kerryanne Leroux, UND EERC

Kessel called the Renewable Energy Council meeting to order.

WELCOME AND OPENING COMMENTS

Kessel welcomed everyone.

APPROVAL OF MINUTES

June 26, 2018, meeting minutes were reviewed.

Schneider moved to approve the minutes as presented. Holth seconded the motion. All in favor. Motion carried.

PRESENTATION OF FINANCIAL SUMMARY

Fine presented the financial summary, which was also posted on the website. Uncommitted dollars available for projects as of August 31, 2018, are $3,740,461.21.

Pfennig introduced Grant Round 38. Four applications were received. Two were sent to technical reviewers for peer review. One was rejected at staff level because it only had state match, so it did not meet the qualifications, and one was withdrawn by the applicant. The total amount of funding being considered today is $805,000.

CONSIDERATION OF GRANT ROUND 38 APPLICATIONS

R038-B: "Fargo's Smart Energy Ramp"; Submitted by eSmart Systems US, Inc.; Principal Investigator: Terry Sando; Project Duration: 18 months; Total Project Costs: $610,000; Request for $305,000.

Pfennig gave an overview of the project. Total project costs are $610,000. This includes cash from the following: eSmart $40,000; Kilbourne Group $20,000 and City of Fargo $50,000. Also includes In-Kind from the following: eSmart $110,000; Kilbourne Group $20,000; Xcel Energy $40,000; Border States Electric $10,000; and MBN $15,000.

The project objective is to demonstrate how a Smart Clean Energy Package that includes renewable energy and artificial intelligence (AI) can add value, cost-effectively attract tenants, and enhance economic development while making efficient use of the utility grid in a public-private partnership.

Overall recommendations were to fund (222) and funding may be considered (167 and 160). Average weighted score was 183 out of 250.

One reviewer felt the proposal does not demonstrate economic viability. The

applicant responded that the purpose of this project is to do the research to demonstrate how to make a Smart Clean Energy Package economically viable in North Dakota, not to start the project with the foregone conclusion that it is economically viable.

One reviewer felt that the project is more AI centric and solar energy availability in ND is not as significant as indicated. The applicant responded that the AI capability will help reduce the electric utility demand charges and help optimize the charging and discharging of battery storage, charging EV's, and control cooling and lighting. The annual average solar radiation in ND is higher than the radiation of Germany and Norway which have an effective use of solar energy.

There were concerns about achievability. One reviewer stated the objective is achievable but fairly limited in scope. Another felt that lack of operational data may pose a challenge. The applicant responded that it is more than a solar and battery demo. The project is consistent with the Main Street ND Initiative, which encourages Smart, Efficient Infrastructure to support Healthy, Vibrant Communities that attracts a 21st Century Workforce. The applicant also noted that Xcel Energy will put in meters and sub-meters to identify electricity use patterns.

In regard to the methodology, one reviewer felt that it was not exceptional or innovative, but it is sound and safe. The applicant responded that the innovative part of this project is the combination of several elements (solar, EV, storage, load control, security lighting, customer payment of solar, customer scheduling of EV charge times, application of AI, development of a guide for cities and developers to use in other projects) in a package or option that developers/cities realistically can see and act on.

Another reviewer felt that the proposal is little more than 15kW of overpriced PV and battery storage to parking garage. While there is some benefit to enhanced intelligent control of the electron flow from grid to storage to use, that is reduced by limited size and diversity of the project.

In terms of scientific/technical contribution, a reviewer felt that there were two research aspects: 1) studying the actual use of the facility; and 2) using smart AI methods to optimize energy generation, storage and use. The reviewer would have liked more information about the AI approach, such as the technology used and the type of network.

A reviewer was unsure about the significance of job creation or increase in renewable deployment as a result of this proposal. Technical contribution, while important, is limited significantly by the scope of the proposed project.

Two reviewers felt the background of the team was exceptional. One reviewer felt there was a lack of background with respect to renewable energy technology and battery storage. The applicant responded that the Assistant PI has considerable background in Europe in renewable energy, storage and EV charging, as well as in applying AI to them.

Two reviewers had concerns regarding the proposed purchase of equipment. One felt that more justification was needed and noted that more information was needed regarding the batteries and cooling system control. The applicant responded that $80K for software licensing is good based on market prices of similar functionality with a 10-year life. The cooling controls are basic and were not emphasized.

One reviewer felt that the equipment was significantly overpriced. The applicant agreed that for a typical roof mounted or ground mounted solar installation the cost would be less. This project involves an elevated structure to allow cars to park underneath. This preserves space that generates revenue for car parking. The battery storage system

will allow for charging of multiple vehicles flexibility in charge times and discharge times in the system. Some of the additional cost is to accommodate the 3-phase power system.

In terms of the value of budget, one reviewer felt that the value of the budget was high, but also was not convinced about the research value of the project. One felt that at $610,000, this is an expensive venture to install a 15kW solar system. One felt the project was characterized by overpriced equipment and top-heavy management.

Overall comments were that one reviewer felt that it seems to be a great idea to experiment with. One reviewer felt that this is an interesting concept but significantly overpriced. One reviewer noted that the average cost of a 15kW PV system is $47,000. Future computing costs and the party responsible for maintenance of the system needs to be determined. At $1,000/kWh, lithium ion batteries should be used. Applicant responded that lithium ion batteries will be used.

Technical advisor recommendations are that funding may be considered. This is an interesting project that could provide information relevant to North Dakota's culture and climate along with solar development. The project has a strong team collaborating and contributing financial support to the project. It should be noted (with the exception of Xcel) the letters of support were not clear about the amount being contributed. Solar, EVs, and charging station activity is growing. West Acres added charging stations to its parking lot. Cass County Electric Cooperative (CCEC) developed a solar garden that enabled members to lease panels. They started with 324 panels in 2016 and are currently approximately 75% sold out. CCEC surveyed its members a few years ago and 50% believed CCEC should be involved in renewable energy. Less than 2% of the same group was willing to pay more for renewables. This is valuable information. Pfennig contacted ND Department of Transportation about electric vehicles in the state, and as of July 1, 2018, in Cass County, there were 1,294 hybrid and 48 electric registered vehicles. In the state overall, there were 3,849 hybrid and 141 electric vehicles. Electric vehicles (EVs) create a new paradigm regarding the payment structure of charging, infrastructure needed, and ownership of the infrastructure. Gathering real time data through meters and submeters from Xcel is a strong aspect of this proposal. The appetite and economic impact of the project for commercialization in North Dakota is unclear. The applicant is a global company; the product/package being developed in part with North Dakota tax dollars would have the potential to not only be sold in North Dakota, but in other places as well.

Suggested contingencies, if funded, had included more details be provided about who will have ownership of the equipment and be responsible for maintenance, but Pfennig just received a letter from the City of Fargo stating that they will take ownership and maintenance of the equipment, so that contingency is no longer needed.

Sando introduced project. Flory presented project. Williams was the second presenter; Piatz was the third presenter; and Conmy was the final presenter.

Pfennig stated that when we funded the geothermal project, one of the problems that they ran into with that housing development when she talked to Jerry Lein at PSC was that they were essentially going to start selling electricity, so they would have to fall under the jurisdiction of PSC. Would there be any kind of issues with charging stations?

Nisbet replied that there could be on those, but not on this one because what we are doing is utilizing most of the energy and we do have the ability to purchase excess energy, but we don't pay a lot for it. We pay the avoided rate which is about 2.8 cents per kilowatt. It's not

a windfall, so they are better off utilizing as much within the building and the charging as they can. When you get to the different stations, I haven't researched that enough to know how that goes.

Schneider asked how people will pay for the electricity – will they swipe a credit card?

Conmy replied that they are in conversations now where there are several different options for that. One is to use an app or use a credit card.

Council took a break at 2:45 p.m. and reconvened at 2:51 p.m.

R038-A: "Integrated Carbon Capture and Storage for North Dakota Ethanol Production-Phase III"; Submitted by EERC; Principal Investigator: Kerryanne Leroux; Project Duration: 18 months; Total Project Costs: $2,650,000; Request for: $500,000.

Bachmeier introduced Phase III of their overall project. Gorecki presented the Phase I part of the project, along with Phase II results.

FINAL REPORT
Integrated Carbon Capture and Storage for North Dakota Ethanol Production-Phase II

It was moved by Schneider and seconded by Christianson that under the authority of North Dakota Century Code 54-63-02 and 44-04-18.4 the Renewable Energy Council close the meeting to the public and enter executive session for the purpose of hearing and discussing the trade secret, proprietary, commercial and financial information that was provided in Appendix E to the final report of the Integrated Carbon Capture and Storage for North Dakota Ethanol Production-Phase II.

All in favor. Motion carried.

Kessel reminded the Council members and those present in the executive session that the discussion during executive session must be limited to the announced purpose for entering into executive session which is anticipated to last approximately 10-20 minutes.

Kessel noted that the Council was meeting in executive session to discuss trade secret, proprietary, commercial and financial information that was provided by the EERC as Appendix E to the final report of Phase II of the project. Kessel stated that "if there is any action by the Council, it will occur after reconvening in open session."

Council members, Department of Commerce staff, Industrial Commission staff, EERC employees, and Red Trail employees remained but the public was asked to leave the room.

The public phone line was closed, and a confidential phone line was opened. Those participating by phone were asked to hang up and call in again on the confidential line/password. Kessel noted that when the executive session ends, the meeting will reconvene in open session and the public phone line would be reopened.

The executive session began at 3:52 p.m. The Renewable Energy Council reconvened in open session at 4:26 p.m.

R038-A: "Integrated Carbon Capture and Storage for North Dakota Ethanol Production-Phase III"; Submitted by EERC; Principal Investigator: Kerryanne Leroux; Project Duration: 18 months; Total Project Costs: $2,650,000; Request for: $500,000.

Pfennig gave an overview of project. Total project costs are $2,650,000; Red Trail $1,750,000 ($950,000 cash; $800,000 in-kind) and DOE $400,000.

The project objectives are to initiate field research plans developed during Phases I and

II. This includes: 1) CO_2 capture process designs will be prepared; 2) Near-surface baseline monitoring and characterization data will be collected; 3) Provisional ND permitting documents for CO_2 geologic storage will be created; 4) Evolving low carbon fuels (LCF) and other incentive programs will be assessed; and 5) Outreach plans created in Phase II will be executed.

Reviewer's overall recommendation was to fund (241, 234, 225). Average weighted score was 233 out of 250.

All three reviewers felt that the goals were clear. One reviewer questioned what portion of the carbon impact of ethanol production can be addressed with a successful effort, stating that production itself accounts for only 50% of the CI, the other half being specific to corn production. It's unclear what portion of the production facility CI will be captured. The PI should be prepared to speak to this point.

In terms of achievability, two reviewers had concerns. One reviewer stated that EERC and Red Trail have not made a firm statement about whether they plan to comply with the permanence protocols proposed by California, which is required for financial incentives under California's Low Carbon Fuels Standard (LCFS.) This may have important implications for the financial viability of the project. It's unclear what the results of the storage feasibility studies will be; it's quite possible the reservoir is more porous than hoped.

All three reviewers were comfortable with the methodology. They felt the scientific/technical contribution could be very significant if successful. All were comfortable with the expertise of EERC. Two reviewers noted the current research activity in the proposal was primarily their own.

Two reviewers felt the project management plan regarding outreach was adequate, while one found it lacking. Pfennig stated that she believes they are following DOE's National Energy Technology Lab best practices, so it is difficult to determine how much could be added to that.

Overall, one reviewer felt that the 5-phase plan was well thought out. One reviewer felt that this is an ideal project and team, but felt more exploration of compliance with the permanence protocols proposed by the State of California for the LCFS is necessary before proceeding from Phase III. One reviewer felt that in addition to concerns about the eventual level of CI mitigation, the cost consideration is a potential issue. The reviewer also noted that there is no way to know for sure without advancing the knowledge of how this would work and what the costs will be.

Technical advisor recommendations are that funding may be considered. If funded, $1.3 million of REP funds will have been invested in this, with two more phases. If successful, this project could have significant impacts on ethanol plants in North Dakota. However, this is a significant amount of REP funds to invest with questions about interfacing with California LCFS. More information from the applicant regarding the economics and intention of moving forward without receiving the financial incentives from the LCFS would be beneficial.

There are no suggested contingencies if funded.

Gorecki stated that the concerns about California are very valid and indicated that it is unclear if that's the best path forward. That's why we've talked about 45Q; that looks like another great path that didn't exist when Phase II began, and now it's there. We can still drive towards California, or Oregon or British Columbia while simultaneously analyzing the extra cost/time and implications and whether North Dakota would allow another agency to come in and check over their shoulders to make sure they do a good job monitoring.

Gorecki presented the rest of the Phase III project.

Christianson asked about life expectancy of Red Trail. Bachmeier replied that it is set at 30 years.

Discussion of proposals:
Christianson asked if contingency on first project is removed. Pfennig stated yes.

COMPLETION OF BALLOTS

R038-B: "Fargo's Smart Energy Ramp"
Fund: 7 No: 0

There was one conflict of interest - Mark Nesbitt.

R038-A: "Integrated Carbon Capture and Storage for North Dakota Ethanol Production-Phase III"
Fund: 7 No: 0

There were no conflicts of interest.

ADJOURNMENT

Meeting adjourned at 4:55

For Michelle Kommer 4/26/2019
Shawn Kessel Date
Chairman

Sherri Stieg for Denise Faber 4-25-19
Denise Faber Date
Acting Recorder