

Minutes of the  
**RENEWABLE ENERGY COUNCIL (REC)**  
 Wednesday, September 22, 2021  
 1:00 p.m. (CT)  
 TEAMS Meeting via conference/video call  
 ONSITE location Ft. Totten Room – Bismarck Capitol

| Members Present  | Staff Present           | Guests Present                  |
|------------------|-------------------------|---------------------------------|
| James Leiman     | Andrea Pfennig, NDIC    | Tom Nelson                      |
| Gerald Bachmeier | Karlene Fine, NDIC      | Hong Durandal                   |
| Al Christianson  | Andrea Rebsom, NDIC     | Keshav Rajpal                   |
| Terry Goerger    | Sherri Frieze, Commerce | Jason Ehlert, Ehlert Excavating |
| Tony Grindberg   |                         | Joel Jorgenson                  |
| Rodney Holth     |                         |                                 |
| Justin Chapman   |                         |                                 |

**WELCOME AND OPENING COMMENTS**

Chairman Leiman called the Renewable Energy Council (REC) meeting to order at 1:00 p.m., welcoming members and guests in the room and on TEAMS.

**APPROVAL OF MINUTES**

**It was moved by Goerger and seconded by Christianson to approve the July 12<sup>th</sup>, 2021 meeting minutes. The motion carried unanimously.**

**PRESENTATION OF FINANCIAL STATEMENT**

Pfennig presented the financial report that had been posted on the Industrial Commission/Renewable Energy program website. As of July 31, 2021, the uncommitted funds for the current biennium are \$1,333,785.97.

**It was moved by Christianson and seconded by Goerger to approve the Financial Statement as presented. The motion carried unanimously.**

**REPORT ON GRANT ROUND 48 APPLICATIONS**

Six applications were received, with four sent to technical review. One applicant withdrew their application today as it was not ready for review. Three applications will be reviewed today for the Council’s consideration. Andrea Pfennig, of the Industrial Commission, presented the Grant Round Requests.

**CONSIDERATION OF SPECIAL GRANT ROUND 47 REQUESTS**

**R-048E - “Grand Forks Green Ag - Park”**

Principal Investigator: Keshav Rajpal  
 Project Duration: 10 months  
 Requesting: \$500,000  
 Total Project Cost: \$4,290,000

Andrea Pfenning gave an overview of the project and stated the applicant is contributing a 86% cash match of \$3,710,000, with APUC providing \$80,000.

**Project’s Objective**

The Red River Biorefinery is proposing a low carbon value added Ag – Park, with four components: 1.) a wheat gluten facility, 2.) a plant-based protein production facility, 3.) an anerobic digester/wastewater treatment facility, and 4.) a biomass based combined heat and power (CHP) facility to power the park.

**Reviewers’ Ratings**

- Fund – 174
- Fund – 241
- Fund – 181

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- Average Weighted Score – 199 out of 250

**Achievability**

One reviewer was very confident in the project, the other two felt the project was likely achievable.

**Methodology**

All three reviewers felt the methodology was good.

**Scientific/Technical Contribution**

All three reviewers were comfortable with the potential scientific/technical contribution. One reviewer noted it would creatively utilize existing energy sources to develop new opportunities.

**Knowledge/Awareness**

Reviewers were comfortable with the knowledge/awareness. One reviewer felt the PI was well qualified but noted there was limited information on other team members.

**Project Management**

All reviewers felt the project management plan was very good.

**Value of Budget**

All reviewers felt the budget was of high value due to the level of match. However, two reviewers had concerns regarding the status/strategy of obtaining the matching funds.

**Overall Comments from Reviewers**

- One reviewer felt the project aligns well with the goals of the program, and the proposal was well put together.
- One reviewer felt that the project was compelling and could be a significant contributor to the local economy.
  - The reviewer also noted that an initial concern regarding feedstock supply chain was addressed.

**Technical Advisor Recommendations**

- Fund
- All three reviewers felt the project merited funding and could impact ND's economy.
- There were no major concerns raised regarding the methodology or achievability.
- One of the most prominent concerns regarded securing the matching funds. It would be beneficial if the applicant could address this further.

**Suggested Contingencies if Funded**

- none

Kesha Rajpal presented PowerPoint slides regarding the Grand Forks Green Ag Park/Red River Biorefinery. (The presentation is available in the Industrial Commission files.)

**R-048B -“Renewable Hydrogen Microgrid”**

Submitted by: BWR Innovations LLC

Principal Investigator: Joel Jorgenson

Project Duration: 24 months

Requesting: \$332,159

Total Project Cost: \$665,909

Andrea Pfennig gave an overview of the project and stated the applicant is contributing a 50% cash match of \$333,750.

- Applicant of match of \$258,750, with \$25,000 in-kind and \$50,000 in-kind from Grand Farm for site location.

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**Project's Objective**

A turn-key sustainable electrical generation system, integrating renewable energy resources (wind and solar) with electrolyzer that produces hydrogen and a hydrogen fuel cell system accompanied with a hydrogen storage system.

**Reviewers' Ratings**

- Fund – 220
- Funding may be considered – 216
- Funding may be considered - 209
- Average Weighted Score – 215 out of 250.

**Achievability**

Two reviewers felt the project was achievable. One had concerns about the system sizing, indicating information was missing; 1.) electricity load and load shape, 2.) electricity efficiency of the electrolyzers, 3.) estimated capacity factors. The reviewer suggested adding two – three wind turbines.

**Methodology**

All three reviewers were comfortable with the methodology. However, the other two reviewers also noted that the proposal lacked information about the expected amount of power generation.

**Scientific/Technical Contribution**

All three reviewers felt the scientific/technical contribution could be significant. One reviewer had concerns about the scalability due to the cost of the fuel cell component and hydrogen tank storage.

**Knowledge/Awareness**

All three were comfortable with the background of the project team. One noted that the partnerships were impressive.

**Project Management**

All reviewers were comfortable with the project management, but one reviewer felt that dependencies among various steps and opportunity for feedback should have been included, along with how that would be communicated. One reviewer felt that energy needs in the summer months should be included.

**Value of Budget**

All reviewers felt the budget was justified. One reviewer felt that a controller to manage the power flow and a power conditioner should be included. One reviewer felt two – three wind turbines should be included.

**Overall Comments from Reviewers**

One reviewer felt that additional information should be provided, including: 1) power ratings of solar panels, 2) power ratings of the wind turbine, 3) need for a power controller and power conditioner, and 4) security features for the telemetry system.)

**Technical Advisor Recommendations**

- Funding may be considered
- While the reviewers all recommended funding the project, they raised some concerns that could limit the success of the project.
- The applicant also noted that NDSU will be instrumental in determining the optimal size of each component and the best paths for revenue optimization for agricultural and commercial users/applications.
- This is an early-stage project with more steps prior to commercialization and application in North Dakota.
- The project has a strategic location at Grand Farm.
- It would be beneficial if the applicant addresses reviewer concerns regarding additional information about the generation capacity, scalability, equipment, and security features.

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**Suggested Contingencies if Funded**

- Letter of commitment with an indication of value of Grand Farm match be provided prior to contract.
- Letter of support from NDSU is provided prior to contract.

Joel Jorgenson presented PowerPoint slides on the project. (A copy of the presentation is available in the Industrial Commission files.)

**R-048C - “Jamestown’s Transportation Center”**

Submitted by: Energy Hunters & S&R Truck Plaza

Principal Investigator: Fu Zhang

Project Duration: 2 years

Requesting: \$252,500

Total Project Cost: \$696,500

Andrea Pfennig gave an overview of the project and stated the applicant is contributing a 64% cash match of \$444,000. Applicant’s match is \$94,000, and \$350,000 DOE.

**Project’s Objective**

Research and develop slow rate charging (solar energy supply and/or grid electricity supply) tied to adaptable modular battery storage units to charge Freight and Battery Electric Vehicles (BEVs) using S&R Truck Plaza & Café as a case study.

**Reviewers’ Rating**

- Funding may be considered – 136
- Funding may be considered – 133
- Funding may be considered – 150
- Average Weighted Score – 140 out of 250.

**Achievability**

The reviewers raise some concerns regarding project achievability. One reviewer felt the timeline was aggressive and the budget had uncertainty. One felt that a quote from a vendor should have been provided, and the last reviewer noted that heavy-duty truck electrification is still under development and that a single location in ND will not achieve the proposed benefits.

**Methodology**

All three reviewers felt the methodology could have been stronger. One reviewer noted that effective electric vehicle charging happens within a network and questioned how market penetration and electricity demand for heavy-duty trucks can be projected using current data. One felt the proposal lacked adequate detail and expertise in energy storage/power electronics. One felt there should be discussion about the current and anticipated patterns of uses. Additionally, the reviewer felt the impact on the grid, especially if heavily used, should be explored.

**Scientific/Technical Contribution**

All three reviewers had some concerns about the scientific/technical contribution. All three felt the awareness of current research activity was limited. One reviewer felt that expertise in solar generation and EV charging was needed and one felt there was a limited understanding of electrical engineering. The applicant indicated there will be dedicated electrical engineer personnel.

**Project Management**

All reviewers raised concerns with the project management plan, including lack of detail and an aggressive timeline.

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**Value of Budget**

All reviewers felt the budget was justified with a score of 3/5. One reviewer felt the value was limited because the following was unclear; 1.) the novelty of the effort, 2.) how it will create jobs, educational outreach, and 3.) cost of savings.

**Overall Comments from Reviewers**

One reviewer felt that additional information should be provided, including: 1) power ratings of solar panels, 2) power ratings of the wind turbine, 3) need for a power controller and power conditioner, and 4) security features for the telemetry system. One reviewer had concerns about the project feasibility as follows:

- 1.) The project timeline may not line up with early adoption of electric heavy-duty trucks.
- 2.) Is the concept of slow charging for electric heavy-duty vehicles reasonable?
- 3.) The timeline is aggressive.
  - o The applicant has indicated that the project can be extended and is not intended to line up with later stage adoption.

One reviewer felt that the project did not explain why it is unique, did not demonstrate an understanding of state-of-the-art charging infrastructure, and does not have the necessary expertise for some of the critical tasks.

One reviewer recommended considering funding in two phases if clarification was provided regarding:

- o Long-term impacts of EV market dynamics, evolving technology and politics, potential burden on the grid, as well as end of life impacts of equipment and long-term permanent jobs.
- o Phase 1 would focus on market study and technology assessment. If found to be feasible, Phase 2 would focus on implementation. The applicant indicated openness to this approach.

**Technical Advisor Recommendations**

- Fund may be considered
- All three reviewers raised concerns and none of the reviewers strongly endorsed the project.
- While there is a ND partner, that partner is not investing funds in the project. It does not appear that there is strong interest from ND private entities.
- The applicant has indicated willingness to provide additional information.
- The proposed project would develop information regarding electric vehicle charging as it relates to heavy-duty trucks, improve compatible battery storage technology, and maximize life cycles of storage units.
- While there is beneficial information to develop, the tangible benefits to the state, it may not be great enough to merit the use of state funds.

**Suggested Contingencies if Funded**

- Project is completed in two phases, with a go/no go decision by the Council after Phase 1.
  - o Phase 1 will focus on market study and technology assessment.
  - o If found to be feasible, Phase 2 will focus on implementation.
- A letter of support from Ottertail Power Company is provided prior to contract.

Hong Durandal presented PowerPoint slides regarding the project. (A copy of the presentation is available in the Industrial Commission files.)

**R-048E - “Grand Forks Green Ag - Park”**

In response to a question, under 40 percent comes from bio-gas or wastewater digestion, and the plan for rail is to spur off of the existing BNSF railroad, loop around to the south side of the facility to the acreage right across from the plant.

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**R-048B - “Renewable Hydrogen Microgrid”**

In response to a question, the price point to produce energy in the microgrid, with that being, after the cost of goods sold, and having near zero maintenance cost, is going to be a near zero operating cost. Aligning CAPEX, point per unit, and smaller unit will be \$30 thousand. The United States Department of Energy estimates fuel cell prices will drop over 80 percent in the next 5-8 years, with it being down to \$40.00 per kilowatt.

In response to a question, the hotel model to provide electricity without any type of interruption, will effectively work as a generator. The fuel cell will take atmospheric hydrogen and oxygen, then create electricity on the spot, exhausted as water vapor.

**R-048C - “Jamestown’s Transportation Center”**

In response to a question, the research is an initiative that the United State Department of Energy has instilled along Interstate 94, from Michigan to Montana. This area is intended to develop an electric network between locations that will have electric vehicle charging stations. Jamestown is one location to have been prioritized, due to the strategic location between Bismarck and Fargo. Electric trucks may not be available in the next two years, but certain big companies are working towards electro finder fleets.

In response to a question, efficiency does drop in electric vehicles in cold or hot weather. A reduction of 20 – 25 percent efficiency has been noted, but the power of the vehicle is not affected. The more often an electric vehicle is charged, the better performance the vehicle will have, so the goal is not to charge the vehicle one hundred percent at one site, but to charge throughout the trip. Our goal is to have independently owned gas stations in ND that will benefit from providing this service and offering trucks the opportunity to charge more often than fewer times.

**Administrative Business**

Mr. Leiman talked about the Clean Sustainable Energy Authority that was formed during the 2021 legislative session. He communicated that the State needs to think systemically across agency programs, private sector, industry, that will help bridge the gaps for these projects to come to existence.

In response to a question, Karlene Fine noted that final reports from funded applicants will be brought forward to the Council at the close of each project. Fine mentioned that some of the projects were granted extensions due to Covid so their completion has been delayed.

A member suggested that when a project was completed, the Council could hold a meeting at their site. Gerald Bachmeier invited the Council to Red Trail Energy.

**COMPLETION OF BALLOTS**

**R-047E – “Grand Forks Green Ag - Park”**

**Project Duration: 10 months**

**Requesting: \$500,000**

**Total Project Costs: \$ 4,29,000**

**Conflict of Interest: none**

**Fund : 7      Do Not Fund: 0      Abstain: 0**

**R-047B – “Renewable Hydrogen Microgrid”**

**Project Duration: 24 months**

**Requesting: \$332,159**

**Total Project Cost: \$665,909**

**Conflict of Interest: none**

**Fund: 7      Do Not Fund: 0      Abstain: 0**

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**R-046C – “Jamestown’s Transportation Center”**

**Project Duration: 2 months**

**Requesting: \$ 252,500**

**Total Project Costs: \$696,500**

**Fund : 1      Do Not Fund: 6      Abstain: 0**

**ADJOURNMENT**

Motion made by Christianson and seconded by Bachmeier to adjourn the meeting. Chairman Leiman adjourned the meeting at 3:00 p.m.



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Sherri Frieze

Date

Boards & Commissions E.A.