

Minutes of the
RENEWABLE ENERGY COUNCIL

Wednesday, December 21, 2016 – 1:30 p.m.
Ft. Union West Conference Room, Great River Energy, Bismarck, ND

CALL TO ORDER

Members Present: Al Anderson, Rod Holth,
Randy Schneider, Mark Nisbet, Al
Christianson, Terry Goerger (by phone)

Members Absent: Kyle Bahls

Others Present:

Andrea Pfennig, Department of Commerce
Karlene Fine, Industrial Commission
Denise Faber, Department of Commerce
Kim Christianson, NDARE, DRC
Claire Lowstuter, Dakota Resource Council
Jimmy Randolph, TerraCOH
John Griffin, TerraCOH

Al Anderson, Chairman, called the Renewable
Energy Council meeting to order.

WELCOME AND OPENING COMMENTS

Anderson welcomed everyone.

APPROVAL OF MINUTES

July 21, 2016, meeting minutes were reviewed.

Christianson moved to approve the minutes as
presented. Nisbet 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 October 31,
2016, is \$3,089,747.10.

**CONSIDERATION OF GRANT
ROUND 30 APPLICATION**

**R030-A: “Commercial Demonstration of
Geothermal Electricity Generation using
Produced Fluids at Existing Hydrocarbon
Wellsites”; Submitted by TerraCOH;
Principal Investigator: Jimmy D. Randolph;
Project Duration: 18 months; Total Project
Costs: \$880,000; Request for: \$440,000.**

Pfennig gave an overview of the project. This
was a special round. The project’s objective is
to examine and demonstrate the commercial
viability of ND’s moderate-temperature
geothermal resources by employing proprietary
geothermal power technology that uses CO₂ as
the heat transfer fluid. TerraCOH will extract
currently-wasted heat energy from produced
fluids demonstrating that low-value
field/natural gas can be integrated with
produced geothermal heat, resulting in a hybrid
power system that uses all energy resources at a
given site. The overall reviewer’s
recommendations follow: Fund (219, 172 and
184). Average weighted score was 192 out of
250.

The reviewers did have some comments.
Regarding achievability, one reviewer noted
that the well site partner, Mountain Divide
LLC, has filed for Chapter 11 bankruptcy
protection. The applicant stated that Mountain
Divide intends to continue operating and that
they are working to sign additional sites for
current and future projects. Regarding the
methodology, one reviewer had the following
concerns: 1) more information regarding the
plan for larger (up to 50 kW) systems needed;
2) the proposal mentions this is dependent upon
well infrastructure, but it is not clear if this is
referring to the geologic conditions that might
support a larger system (higher heat and/or

larger fluid flow) or presence of “surplus” natural gas available for combining with the geothermal energy potential. The applicant responded that the size of an installation at a given site will largely be determined by geologic conditions. A secondary consideration is availability of low-value natural gas, which would allow construction of larger facilities. However, their focus is on geothermal heat energy.

A reviewer commented that a secondary deliverable is stated as an updated estimate of the geothermal potential of ND, but this activity is not clearly defined in the project plan and/or the budget. The applicant responded that they intend to survey the existing wells (producing and capped) and calculate geothermal potential based on publicly-available information and future partnering ND oil and gas producers’ site data. They will also estimate the geothermal potential when existing wells are operated in a way that is ideal for geothermal power production rather than oil and gas production. UND will assist in the proposed effort. However, UND did not state this is in the supporting letter, and it is not accounted for in the budget. One reviewer decreased the score in the scientific/technical contribution from last time due to learning about other potential waste-heat-to-energy solutions available for the ND region and questioned: 1) if the effort to produce 10kW of power is a good use versus such alternatives; and, 2) if there’s a currently unaddressed market need for such power. The applicant responded that the 10kW system is a demonstration of the technology. Installed, commercial systems will be larger, up to multiple MW’s. With the oil boom and associated increase in power demand from both oil operations and increased population, there does appear to be a need for additional local power. Utilities in ND have expressed the need for additional power in the near and long term.

The reviewers seemed comfortable with the knowledge of the project team. One reviewer commented that they have now brought in ND based research and contractor collaborators. However, one reviewer felt knowledge of electricity policy was still a weakness. The applicant responded that they will work to bring in additional expertise, but that they do have some capabilities in this area.

Two reviewers felt the project management plan was good. One reviewer stated the following concerns: 1) completion of the detailed project plan is in fact a milestone itself, which is missing; 2) the project plan makes no mention of the work associated with the secondary deliverable of updating the state of North Dakota Geothermal Energy Potential; and, 3) the service agreement with Mountain Divide, LLC states that TerraCOH will uninstall the system upon conclusion of the demonstration, but the site manager is only funded through June 2018 and the project is slated to conclude in July 2018. The uninstall is not included in the project plan. The proposal states that Wenck will file any necessary permits, but this task is not included in the project plan. The applicant has stated that they are willing to incorporate these items to the project plan.

Overall, one reviewer commented that a potential weak link is the reliance upon proprietary technology from a startup. The reviewer also questioned if this is the best way to capture waste heat having seen other approaches (thermovoltaic, e.g.). The reviewer felt there may be benefits to developing this technology beyond this initial application and that only additional investigation can determine how this approach stacks up versus emerging alternatives. Overall, another reviewer had concerns that the proposal bounces back and forth between “geothermal only” electricity production and “geothermal/natural gas hybrid” electricity production. The applicant has stated that their focus is geothermal, but

they will make use of all underutilized resources where appropriate. Overall, the third reviewer stated that the detailed project plan to be prepared upon funding should be reviewed by NDIC/REC personnel within the first 30 days of the project to ensure it addresses all milestones, deliverables, and decommissioning along with a contingency plan should Mountain Divide LLC's financial circumstances prove a problem.

Our recommendation is that funding may be considered. This project provides a nice opportunity to highlight synergies between renewable and traditional forms of energy that are abundant in our state. It could lead to new opportunities for economic development. The applicant has taken steps to establish a business presence in North Dakota; supporting documentation on this would be beneficial. It is very concerning that the well site has filed for bankruptcy. It is difficult to justify putting public funds towards a project when this portion of the project, along with a detailed project plan, are in question. We don't have a mechanism in place to review aspects of a proposal after it has been approved for funding. It should also be noted that while Mountain Divide, LLC operates in North Dakota, it is a MT entity.

The suggested contingencies, if funded, are 1) the applicant must verify it has established a North Dakota business presence and funds must go through that entity; 2) if Mountain Divide site falls through, the new well site must be through an independent operator in North Dakota, helping to demonstrate that industry sees a need and value for this project, and; 3) the applicant must complete a detailed project plan that accounts for decommissioning the secondary deliverable, and a contingency plan should Mountain Divide LLC's financial circumstances prove a problem.

Jimmy Randolph presented the project. John Griffin also assisted with the presentation.

COMPLETION OF BALLOTS

R030-A: "Commercial Demonstration of Geothermal Electricity Generation using Produced Fluids at Existing Hydrocarbon Wellsites"

Fine did not include the third contingency. Only the first two were added. The contingencies added were: 1) the applicant must verify it has established a North Dakota business presence and funds must go through that entity; 2) if Mountain Divide site falls through, the new well site must be through an independent operator in North Dakota, helping to demonstrate that industry sees a need and value for this project. There were no conflicts.

Discussion of the project followed.

Schneider expressed concerns with the REC's not being visited with to see if there is a need, and with the company not being from North Dakota.

Holth commented that he was not comfortable with the numbers, and if it was something that they could make economically work.

Goerger commented that there really isn't a process to take it to commercialization yet, and there is still a lot of research going on.

Christianson had a concern with the CO2 process, and with the company filing for bankruptcy.

Fund: 0 No: 6

ADMINISTRATIVE BUSINESS

Other Business – Amendment to Policies, Revisions to Application deadline. REC – 4.02 Application deadline. Applications each calendar year must be delivered to the Industrial Commission or postmarked on or before ~~January 1, May 1 and September 1~~

