

MEETING MINUTES

LIGNITE RESEARCH COUNCIL MEETING GRANT ROUND LRC (102)

Thursday, May 11, 2023 - 1:30 p.m. (CT)

Bismarck State College – National Energy Center of Excellence Room #335

LRC VOTING MEMBERS PRESENT:

Randy Christmann – North Dakota Public Service Commission
Representative Todd Porter – North Dakota House of Representatives
Senator Dale Patten - North Dakota Senate
Gavin McCollam – Basin Electric Power Cooperative
Dale Johnson – Dakota Gasification Co.
Mike Heger – BNI Energy
Charlie Gorecki – Energy & Environmental Research Center (EERC)
Ed Murphy – North Dakota Geological Survey
Jay Skabo – Montana-Dakota Utilities Co.
Bryan Walther – North American Coal Company
Tom Oakland – North Dakota Commerce
John Bauer - Rainbow Energy Center
Brenden Brinkman - Coyote Creek Mine
Jay Kost – The Falkirk Mining Company
Tim Hagerott – Minnkota Power Cooperative
Mark Hager - IBEW 11th District ND
John Phillips – ND Coal Conversion Counties Association
Al Christianson – Nexus Line LLC
Joseph Heringer – Land Board
Rita Faut – North Dakota Farm Bureau

OTHERS PRESENT:

Reice Haase – North Dakota Industrial Commission
Brenna Jessen – North Dakota Industrial Commission
Mike Holmes – Lignite Research Council
Angie Hegre - Lignite Energy Council
Jonathan Fortner – Lignite Energy Council
Andrew Freidt – Minnkota Power Cooperative
Chuck Hyatt – ND Department of Environmental Quality (NDDEQ)
Brad Zimmerman – Otter Tail Power Company
Ned Kruger – North Dakota Geological Survey

GUESTS:

Retha Mattern – Lignite Energy Council
Jason Laumb – EERC
Amanda Livers-Douglas – UND & EERC
John Kay – UND & EERC
Greg Henthorne – AmeriCarbon Products, LLC
Johannes van der Watt – UND
John Reiten - ND Governor's Office
Nolan Theaker- UND
Stacy Tschider-Rainbow Energy Center
Jessica Bell – Rainbow Energy Center
Daba Gedafa – UND
Ryan Rayda – Barr Engineering
Dan Laudal – UND

I. CALL TO ORDER

Meeting called to order:

Lignite Research Council (LRC) Vice Chairman, Commissioner Randy Christmann, called the LRC meeting to order at 1:33 p.m. (CT) on May 11, 2023.

II. APPROVAL OF MINUTES

Approval of November 17, 2022, LRC Meeting Minutes:

Commissioner Christmann asked for a motion to approve the minutes from the above-listed meeting. Dale Johnson so moved; seconded by Jay Skabo. Motion carried.

III. PROGRAM FINANCIAL SUMMARY

Program Financial Summary:

Reice Haase shared the financial summary regarding the Lignite Research, Development and Marketing Program. (A copy of the financial summary is available in the Lignite Research Program files, and in the meeting packet provided.)

Haase reviewed the 2021-2023 budget spreadsheet with the group. The beginning balance as of July 1, 2021, was \$21.8 million. He stated the cash balance as of March 31, 2023, was \$28.6 million after adding revenue of an additional \$17.7 million and then deducting the expenditures of \$10.8 million. Then deducting the outstanding commitments of \$20.4 million, the non-committed cash balance is \$8.2 million. Haase shared with the group that this is the amount they have available for consideration. Haase explained if you extrapolate that to the end of the biennium, and use the estimated budget for the remaining biennium, you get a remaining cash balance of \$9.1 million.

Angie Hegre emailed the financial spreadsheet a week prior to the meeting to the LRC members so the group saw all the details provided by Reice Haase.

IV. GRANT ROUND 102 APPLICATIONS

LRC-102A: Lignite Energy Council Education Program

Submitted by: Lignite Energy Council

Request for: \$450,000

Total Project Costs: \$908,000

Principal Investigator: Retha Mattern

Project Duration: 36 months

Haase shared that the applicant is requesting funding for three years to continue the Lignite Education Program. Funding includes costs for the annual four-day Lignite Education Seminar, program management for the Education Program, and the costs for professional services provided through the ND Energy Career Awareness program. The objective of this program is to educate teachers, students, and members of the public in the region about career opportunities, energy production, economic benefits, and operations of the Lignite Industry. The expected outcomes of the Project include:

- Improved perception of lignite
- Increased awareness of lignite's contributions to North Dakota's economy

- Increased understanding of future growth opportunities within the lignite industry

Haase recommended funding of this project. He shared that the two technical reviewers recommended fully funding the project as well. The reviewers provided positive comments about the objectives, achievability, methodology, contribution, awareness/background of the principal investigators and the budget.

Haase shared that the funding would be subject to semi-annual reporting be provided to the Industrial Commission.

Haase shared the conflicts of interest being Lignite Energy Council and members of the Lignite Energy Council.

Retha Mattern, LEC, presented on behalf of the applicant. (A copy of their Power Point presentation is available in the LRP files.)

LRC-102B: Redundancy Study for CO2 Capture at Coal Creek Station

Submitted by: EERC

Request for: \$837,313

Total Project Costs: \$1,674,627

Principal Investigator: Jason Laumb

Project Duration: 9 months

Holmes shared The EERC in partnership with Rainbow Energy Center (REC) is proposing to evaluate equipment redundancy needs for carbon capture at the Coal Creek Station. The project would support the front-end engineering design study for the capture plant through this study to reduce operational risks for supplying baseload power with high reliability and availability. The project would leverage state funding with matching cash from REC. The project results would provide a cost-benefit analysis for design of the system with redundancy. This effort also supports the original REC Coal Creek Station carbon capture project intent to 1) reduce the technological and economic risks associated with investing in a post-combustion capture retrofit project and 2) provide information and learnings that will enable evaluation and deployment of similar North Dakota facilities.

As the Technical Advisor, Holmes recommended funding. He stated the proposed project is important to the Lignite Research Program, as part of the carbon management efforts for North Dakota lignite. Results would be valuable for any plant considering CCUS. All three of the technical reviewers recommended funding, and the proposal received an average score of 209 out of 250. The project provides leveraging of state funding through industry cash.

Holmes stated that funding be subject to the Technical Advisor participating in project reviews and the Technical Advisor reviews the project management plan with the project team.

Holmes stated conflicts of interest include EERC, Rainbow Energy Center, North American Coal Falkirk Mine indirectly.

Jason Laumb, EERC, presented on behalf of the applicant. (A copy of their Power Point presentation is available in the LRP files.)

LRC-102C: Coal Creek Carbon Capture: Geologic CO2 Storage Complex Development

Submitted by: UND Energy & EERC

Request for: \$6,119,690
Total Project Costs: \$50,387,901
Principal Investigator: Amanda Livers-Douglas
Project Duration: 39 months

Holmes shared that EERC in partnership with Rainbow Energy Center (REC) is proposing to advance development of a geologic carbon dioxide (CO₂) storage complex in central North Dakota to store CO₂ captured from Coal Creek Station. The objective of Stage 1 is to conduct a set of activities necessary to advance site characterization, including evaluation of existing two-dimensional (2D) seismic data, geologic modeling, and CO₂ injection simulations to inform placement and design of a stratigraphic test well. The objective of Stage 2 is to fully characterize and permit the geologic CO₂ storage complex. The project would leverage state funding with matching cash from REC in Stage 1 and DOE funding would be added in Stage 2. Successful completion of Stage 2 would result in a fully characterized and permitted geologic CO₂ storage complex.

As the Technical Advisor, Holmes recommended funding. He shared that the proposed project is important to the Lignite Research Program, as part of the carbon management efforts for North Dakota lignite. Results would be valuable for any plant considering geologic storage in the immediate region. All three of the technical reviewers recommended funding, and the proposal received an average score of 239 out of 250. The project provides leveraging of state funding through industry cash in Phase 1 and would add significant DOE funding in Phase 2.

Holmes stated that funding be subject to the Technical Advisor participating in project reviews and the Technical Advisor reviews the project management plan with the project team and encumber phase 1 (\$1.35M) now, with phase 2 (\$4.77M) contingent upon award from DOE.

Holmes stated conflicts of interest include EERC, Rainbow Energy Center, North American Coal Falkirk Mine indirectly.

Amanda Livers-Douglas, UND& EERC, presented on behalf of the applicant. (A copy of their Power Point presentation is available in the LRP files.)

LRC-102D: Engineering Design and Feasibility Analysis for Commercial Graphite and Asphalt Manufacturing from Lignite-Derived Carbon Pitch

Submitted by: AmeriCarbon Products, LLC
Request for: \$700,000
Total Project Costs: \$1,400,000
Principal Investigator: David Berry
Project Duration: 18 months

Holmes introduced AmeriCarbon Products, LLC. They propose to build on their existing project with the Lignite Research Program. Having demonstrated successful production of commercial grade lignite-derived carbon pitch, the primary objective of the current proposal is to develop the engineering design for a commercial scale facility in North Dakota. The facility would be designed to convert coal to carbon pitch, asphalt, and battery grade graphite. By-products will also include a concentrated ash that contains rare earth elements (REEs) and certain hydrocarbon liquids, converting nearly all of the lignite feedstock into saleable products. The primary participants include AmeriCarbon Products, LLC (applicant), the UND Institute for Energy Studies, Barr Engineering, and North American Coal Corporation. State funding would be matched against cash and in-kind from AmeriCarbon and their project partners.

As the Technical Advisor, Holmes recommended funding. He shared that the proposed project could provide multiple products from the North Dakota Lignite resource. The project would focus on engineering and design of a commercial plant for North Dakota lignite. All three of the technical reviewers recommended funding, and the proposal received an average score of 215 out of 250. The project would leverage state funding through funding from the project participants.

Holmes stated that funding be subject to the Technical Advisor participating in project reviews, the Technical Advisor reviews the project management plan with the project team and NDIC cost share review.

Holmes stated conflicts of interest include North American Coal.

Greg Henthorne presented on behalf of AmeriCarbon Products, LLC. (A copy of their Power Point presentation is available in the LRP files.)

LRC-102E: Williston Basin CORE-CM Initiative - Continued Assessment

Submitted by: UND Energy & EERC

Request for: \$1,050,000

Total Project Costs: \$2,100,000

Principal Investigator: John Kay

Project Duration: 16 months

Holmes introduced the next proposal. The EERC is proposing added scope for the team of roughly 30 members focused on producing rare-earth elements (REEs), critical minerals (CMs), and nonfuel carbon-based products (CBPs) from Williston Basin coals. The EERC has received additional funding from the DOE and industry, providing the leveraging of NDIC project funding. The goal of the Williston Basin CORE-CM Initiative is to lay the foundation for new industry, as well as drive the expansion and transformation of the existing coal and coal-based resources industry in the Williston Basin to produce REEs, CMs, and CBPs. The additional effort that is currently proposed, is focused on gathering additional resource data for REEs and CMs in coal country within the Williston Basin, identifying data gaps that need to be filled, and developing the strategies necessary to move forward with demonstrations along the entire supply chain.

As the Technical Advisor, Holmes recommended funding. He shared that the proposed project is a great fit for the Lignite Research Program, as part of the pursuit of emerging markets for North Dakota lignite. All three of the technical reviewers recommended funding, and the proposal received an average score of 211 out of 250. The project leverages state funding by obtaining funding from the DOE and industry.

Holmes stated that funding be subject to the Technical Advisor participating in project reviews, the Technical Advisor reviews the project management plan with the project team.

Holmes stated conflicts of interest include EERC, Rainbow Energy Center, North American Coal-Falkirk and BNI.

John Kay presented on behalf of EERC. (A copy of their Power Point presentation is available in the LRP files.)

LRC-102F: Assessment of Lignite-Based Industrial Residues for Value-Added Product Creation through CO2 Mineralization

Submitted by: UND

Request for: \$250,000

Total Project Costs: \$1,250,000

Principal Investigator: Johannes van der Watt

Project Duration: 24 months

Holmes introduced project 102F. UND is proposing to assess the techno-economic feasibility of using carbon dioxide mineralization of lignite ashes and dry scrubber residues. The target is to beneficiate the materials to change them from wastes to marketable products. A primary target market is for concrete manufacture. The team has secured \$1 million in funding from the DOE.

As the Technical Advisor, Holmes recommended funding. The proposed project targets remediating coal ashes to expand their marketability for uses such as concrete manufacture. The technology uses CO₂ mineralization of ashes and dry scrubber residue. All three of the technical reviewers recommended funding, and the proposal received an average score of 198 out of 250. The project would provide strong leveraging of state funding with 80 percent of the funding from the DOE.

Holmes stated that funding be subject to the Technical Advisor participating in project reviews, the Technical Advisor reviews the project management plan with the project team.

Holmes shared that there are no direct conflicts; Basin, Minnkota and Otter Tail discussion and samples.

Johannes van der Watt presented on behalf of UND. (A copy of their Power Point presentation is available in the LRP files.)

LRC-102G: Recovery and Refining of Rare Earth Elements from Lignite Mine Wastes

Submitted by: UND Institute for Energy Studies

Request for: \$2,000,000

Total Project Costs: \$9,999,999

Principal Investigator: Nolan Theaker

Project Duration: 15 months

Holmes introduced the final proposal of the day. Holmes stated a team led by UND College of Engineering and Mines (CEM) is requesting funding to perform a Front-End Engineering & Design (FEED) study and develop business and financial plans for a commercial demonstration facility to recover rare earth elements (REEs) and critical minerals (CMs) from lignite. The overall objective of this phase is to produce an investment quality project and the committed team ready to execute the construction and operation of the REE Demonstration Facility in Phase 2 (~\$250 million). The results are expected to fill key technical gaps and de-risk the commercialization pathway. This is one of two projects supported by DOE at the FEED level, with 80 percent of the project costs covered by DOE.

As the Technical Advisor, Holmes recommended funding. The proposed project is the next step for the UND IES pursuit of REE's and CMs from North Dakota lignite. The project would provide a FEED study with more detailed economics. Two of the technical reviewers recommended funding while the third reviewer recommended funding may be considered pending answers to the challenging schedule. The proposal received an average score of 224 out of 250. The project provides good leveraging state funding by obtaining funding from the DOE.

Holmes stated that funding be subject to the Technical Advisor participating in project reviews, the Technical Advisor reviews the project management plan with the project team. He also mentioned an extra focus on the challenging schedule.

Holmes stated conflicts of interest include Rainbow Energy Center, North American Coal, BNI and Minnkota.

Nolan Theaker presented on behalf of UND Institute for Energy Studies. (A copy of their Power Point presentation is available in the LRP files.)

Commissioner Christmann asked the group to declare any conflicts of interest. Projects noted below.
Kost – B, C, D, E, G. Bauer – B, C, D. Hagerott – A, G. Christianson – B, C, F. Gorecki – A, B, C, D, E, F, G. Walther – B, C, D, E, G. Skabo – A. Faut – A. Brinkman – A, B, C, D, E, G. Heger – A, E, G. McCollam – E. Johnson – A, E.

Motion was moved to approve and allow all conflicts of interest. Senator Patten so moved, seconded by Representative Todd Porter. Motion carried.

V. RESULTS

LRC-102A: Lignite Energy Council Education Program

Fund: 20 votes

Do Not Fund: 0 votes Abstain: 0 votes

LRC-102B: Redundancy Study for CO2 Capture at Coal Creek Station

Fund: 20 votes

Do Not Fund: 0 votes Abstain: 0 votes

LRC-102C: Coal Creek Carbon Capture: Geologic CO2 Storage Complex Development

Fund: 20 votes

Do Not Fund: 0 votes Abstain: 0 votes

LRC-102D: Engineering Design and Feasibility Analysis for Commercial Graphite and Asphalt Manufacturing from Lignite-Derived Carbon Pitch

Fund: 20 votes

Do Not Fund: 0 votes Abstain: 0 votes

LRC-102E: Williston Basin CORE-CM Initiative - Continued Assessment

Fund: 20 votes

Do Not Fund: 0 votes Abstain: 0 votes

LRC-102F: Assessment of Lignite-Based Industrial Residues for Value-Added Product Creation through CO₂ Mineralization

Fund: 19 votes

Do Not Fund: 1 vote Abstain: 0 votes

LRC-102G: Recovery and Refining of Rare Earth Elements from Lignite Mine Wastes

Fund: 20 votes

Do Not Fund: 0 votes Abstain: 0 votes

VI. 2022-2023 CALENDAR

Commissioner Christmann announced that the next NDIC meeting is scheduled for May 25, 2023. A reminder of the fall grant deadline of October 1, 2023, with the LRC meeting on November 9, 2023 and the Industrial Commission following on November 28, 2023.

VII. OTHER BUSINESS

Holmes reminded the group of the virtual administrative meeting that will be announced for June or July 2023.

Topics to follow up on will include:

- Language of adding “or designee” / primary voter / alternates
- Confirm virtual option for joining meetings.
- Election of LRC Executive Committee members
- Amendments

VIII. ADJOURNMENT

There being no further business, Commissioner Christmann requested adjournment of the LRC meeting.

The North Dakota Industrial Commission meeting, when these recommendations will be considered, will be held on May 25, 2023.

Angie Hegre, recording secretary