

MEETING MINUTES
LIGNITE RESEARCH COUNCIL – GRANT ROUND 94
Thursday, November 12, 2020 - 1:30 p.m. (CT) via WebEx

LRC VOTING MEMBERS (or their authorized alternates) PRESENT:

Jason Bohrer – Lignite Research Council, Chairman
William Sawyer – ALLETE Energy
John Bauer – Great River Energy
Wade Boeshans – BNI Coal, Ltd.
Randy Christmann – North Dakota Public Service Commission
Rita Faut – ND Farm Bureau
Dave Glatt – North Dakota Dept. of Environmental Quality
Charlie Gorecki - Energy & Environmental Research Center (EERC)
Jay Kost – Falkirk Mining Company
Mark Hager – IBEW 11th District (ND)
Don Hochhalter - North Dakota Department of Commerce
Dale Johnson – Basin Electric Power Cooperative (Dakota Gas)
Gavin McCollam – Basin Electric Power Cooperative
Ned Kruger – North Dakota Geological Survey
Gerry Pfau – Minnkota Power Cooperative
John Phillips – Coal Conversion Counties
Jay Skabo – Montana-Dakota Utilities Co.
Brad Zimmerman – Otter Tail Power Company
Bryan Walther – North American Coal Company
Kai Xia – Great Northern Properties LP

OTHERS PRESENT:

Dave Allard – Lignite Energy Council
Karlene Fine – North Dakota Industrial Commission
Angie Hegre - Lignite Energy Council
Steve VanDyke – Lignite Energy Council
Mike Holmes – Lignite Research Council
Andrea Pfennig- North Dakota Industrial Commission

GUESTS:

John Weeda, ND Transmission Authority (presenter)
William Easter, Semplastics (presenter)
Paul Gandola, Mattoon Power (presenter)
Gregory McRae, Mattoon Power (presenter)
Xiaodong Hou, Institute for Energy Studies, UND (presenter)
Kay LaCoe, Lignite Energy Council (presenter)
Junior Nasah, Institute for Energy Studies, UND (presenter)
Kevin Connors, EERC (presenter)
Barbara Hopkins, Semplastics
Mike Mann, Institute for Energy Studies, UND
Gregory McRae, Mattoon Power (presenter)
Geoff Simon, Western Dakota Energy Association
Jason Ehlert, North Dakota Building Trades Unions
Amy Sisk, Bismarck Tribune

I. CALL TO ORDER

Meeting called to order:

Lignite Research Council (LRC) Chairman, Jason Bohrer, called the LRC meeting to order at 1:40 p.m. (CT) on November 12, 2020 via WebEx conferencing.

II. APPROVAL OF MINUTES

Approval of August 13, 2020 LRC Meeting Minutes:

Bohrer asked for a motion to approve the minutes from the August LRC Meeting. Randy Christmann so moved; seconded by Jay Skabo. Motion carried.

III. PROGRAM FINANCIAL SUMMARY

Program Financial Summary:

Karlene Fine 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.)

Fine shared the 2019-2021 budget spreadsheet with the group. She stated the cash balance as of September 30, 2020 was \$39.8 million including the \$10 million transfer from the oil and gas tax revenues that was made in October. At this point, Fine shared we are forecasting additional revenues of \$4.1 million during the 2019-2021 biennium. Fine shared the remaining un-committed balance between the two categories of Small Research/Education/Demonstration Projects (\$5.4 million) and Advanced Energy Technology Projects (\$2.1 million) totaled \$7.5 million. Fine stated that all the projects being reviewed at this LRC meeting fall under the Small Research/Education/Demonstration Projects line item.

Angie Hegre emailed the financial spreadsheet one week prior to the meeting to the LRC members so the group saw all the details provided by Karlene Fine.

IV. PROGRAM UPDATES

Program Update - Mike Holmes

Holmes shared active and recently completed Lignite Research Program Projects to include the following.

Recently Completed Projects:

- **EERC / ND Integrated Carbon Storage Complex Feasibility Study** – Evaluation of two locations for the potential to store CO₂ at the commercial scale in North Dakota. Funding: \$1,500,000 through LRP / \$13,857,978 total.
- **EERC / Project Carbon** – The project provides an initial look at carbon capture, utilization, and storage in North Dakota, including technology testing, initial engineering work, and preliminary economic considerations. Funding: \$3.2 million through LRP / \$12.7 million total.

- **EERC / Economic Extraction and Recovery of REEs and Production of Clean Value-Added Products from Low-Rank Coal (LRC) Fly Ash** – The project focused on evaluating and further developing the technical and economic viability of REE recovery from lignite-based ash. Funding: \$30,000 through LRP / \$510,000 total.

Active Projects:

- **NDSU / Management Practices to Improve Soil and Vegetation Parameters on Reclaimed ND Coal Mine Lands** – The project is focused on next steps to further the mine reclamation practices in North Dakota. Funding: \$578,157 through LRP / \$1,156,374 total.
- **UND Institute for Energy Studies / Investigating the Use of Fly Ash for Sustainable Asphalt Pavements** – Evaluates the applicability of North Dakota lignite fly ash as a mineral source for asphalt. Funding: \$53,814 through LRP / \$119,463 total.
- **Minnkota Power / Project Tundra** – Front End Engineering and Design (FEED) study for carbon capture utilization and storage at the Milton R. Young plant. Funding: \$15 million LRP / \$31,164,414 total.
- **Minnkota Power / Project Tundra FEED Amendment** – Increases the scope related to a near-term focus on CO₂ storage adjacent to the plant, to enable large amounts of storage when oil prices and other factors impact the demand for EOR. Increases LRP funding by \$5 million to \$20 million, with additional cost share bringing the total project size to \$46 million.
- **MTI / Development of Low-Cost Rare Earth Element Analysis and Sorting Methods** – This project targets the development of advanced sensor technology combined with novel predictive algorithms to enable low-cost and accurate selective mining and sorting of high rare earth element (REE) content coal and coal-related feedstocks. Funding: \$226,767 LRP / \$449,534 total.
- **UND Institute for Energy Studies / Rare Earth Element Extraction and Concentration at Pilot-Scale from North Dakota Coal-Related Feedstocks – Phase 3** – The team has initiated Phase 3 with DOE and North Dakota, directed at demonstrating their novel technology for rare earth element recovery from North Dakota lignite coal feedstocks at the pilot scale. Funding: \$900,000 LRP / \$6,508,555 total. Note that the project team recently received DOE approval to continue the project into costing and business analysis for a 1 to 3 metric tonne (REE solids) per day, over the next year.
- **Barr Engineering / Mitigation of Alkali Promoted Ash Deposition and Emissions from Coal Combustion** – Evaluation of technology for prevention and removal of aerosols in lignite fired systems to improve operation and provide improvements for any future CCUS systems. Funding: \$400,000 LRP / \$4,999,412 total.
- **Great River Energy / Preliminary Front End Engineering and Design (pre-FEED) Study for a full-scale carbon dioxide capture system at Coal Creek Station (CCS2)** – This project provides an initial investigation of the potential for CCUS at Coal Creek through a pre-FEED study and includes investigation of the storage geology. Funding:

\$4,239,000 LRP / \$8,478,000 total. Project switched over to EERC with continued support from GRE.

- **EERC / Wastewater Recycling Using a Hygroscopic Cooling System** – Evaluation of novel cooling system for power plants with a focus on water management. Funding: \$100,000 through LRP / \$820,600 total.
- **EERC / PCOR Initiative to Accelerate CCUS Deployment** – This project provides a continuation of the PCOR program to help address challenges and opportunities for commercial CCUS in the region. Funding: up to \$2 million LRP / currently \$6,254,617 total (additional federal funding anticipated).
- **EERC / Laboratory-Scale Coal-Derived Graphene Process** – Development of a technological process for converting North Dakota Lignite into high-value solid carbon products such as graphene. Funding: \$162,500 through LRP / \$931,600 total.
- **Midwest AgEnergy / Drill Stratigraphic Test Well & Determine Feasibility of Central ND Geology to Safely and Permanently Store Carbon Dioxide** – Providing information related to geologic storage of carbon dioxide with a focus on the area surrounding Blue Flint Ethanol and the Coal Creek Energy Park. Funding: \$3,388,000 through LRP / \$6,956,000 total.
- **Dakota Gasification Co. / Naphtha and Tar-Oil Overhead Refining Project** – Engineering study to upgrade and increase the value of the naphtha and tar-oils at the Synfuels Plant, targeting the gasoline blendstock market. Funding: \$142,500 through LRP / \$285,000 total.

Mike Holmes stated that a year ago a complete update to the Enhance, Preserve, and Protect (EPP) project was done. Holmes shared that this project builds on previous work to preserve and protect the existing lignite fleet in North Dakota and to identify opportunities to enhance the future of the state’s lignite resources. Previous regulatory policy jeopardized the future of North Dakota’s lignite resources and that regulatory environment continues to be dynamic. This project allows for flexibility and timeliness in working with the industry and regulators so that North Dakota can make the best use of its vast lignite resources. Holmes shared the EEP breakdown of responsibilities and leaders and stated that this team works along with consultants who have legal, research and development, environmental and transmission technical expertise to execute the project.

- Mike Holmes, Project Manager, R&D, and strategic studies activities
- Jason Bohrer, LEC President/CEO serves as a policy advisor to the EPP Project.
- Jonathan Fortner oversees the environment strategies and activities.
- John Weeda serves as the ND Transmission Authority Director.

Holmes shared with the group that as part of the EPP project, there are a number of white paper studies. He listed some ongoing, revisited, and possible future studies.

- NDSU Economic Impact
 - Regional Economic Impact of CCUS
- Additional Value Opportunities for Lignite / Update
- Evaluation of ESG Impacts on Lignite
- Carbon Management Summary

- MISO and SPP Impacts
- Evaluation of Demand Growth / Update
- Research Priorities
- Others to be identified jointly between industry and the Industrial Commission.

Holmes shared a Lignite Industry Impacts-Study released by NDSU to highlight the economic impact the lignite industry has on ND. Approximately \$5.4 billion in business activity and ~14,000 total jobs.

Holmes shared an EERC study of carbon capture and EOR operations and how it would boost ND economy. Assuming one plant for EOR and balance in saline formations. Total annual economic activity of \$2.5 billion and an additional jobs creation of 8,000.

Holmes shared a scenario of full potential for conventional EOR if additional conventional oil fields were added to the study. Over 30 years, a possible \$45 billion in economic impact and 15,000 long-term jobs per year.

Holmes shared additional value opportunities for Lignite to include current commercial uses and technology developments and opportunities. Coal gasification for fuels, chemicals, and Hydrogen. Holmes discussed several carbon-based products as well.

Holmes discussed the EPP environmental strategies – the EPP team continues to coordinate response to environmental issues facing the ND lignite industry. He shared areas of support.

Bohrer shared the legal strategies and activities coordination of legal assistance needed to address state and federal statues and regulations. These include the actions identified in the environmental area and legal assistance relating to the ND Transmission Authority as it reviews and comments on rules from organizations such as the Federal Energy Regulatory Commission, MISO and others. Bohrer shared recent and ongoing activities.

ND Transmission Authority, John Weeda

John Weeda stated that there are two system operators that operate the transmission lines in North Dakota - MISO and SPP. Weeda noted that the transmission system is full. Weeda presented graphs of the NDEX Tie Line MVA flow totals pointing to a full grid as well. The volatility of pricing is also indicating the lines are full. Weeda shared measurement taken in the Leland Old’s area. In 2019 the variation of prices was dramatically higher than the pricing seen in previous years. All interconnect requests in the last round for ND resulted in projects being cancelled due to high cost. This is affecting both projects with MISO and with SPP interconnects.

Weeda presented a graph of renewable energy penetration levels and MISO’s Renewable Integration Impact Assessment (RIIA) indicating integration complexity increasing sharply beyond 30% renewable penetration. Weeda shared the Legislature is looking at our policies and resources in ND to ensure we have a reliable grid, good pricing for ND loads, which is important to consumers but also to our major industries in ND.

Weeda discussed Coal Creek Station hanging in the balance at this point. He shared that entities are seeking to buy the Coal Creek Station plant and the DC transmission line. They don’t know yet if they can make that attractive to Great River Energy. They would likely continue to look at CO₂ capture and offer a variety of “products” on the line. Other entities seeking to buy the line want to reserve it for

wind generation. Weeda shared it is not only the generator itself, but all the opportunities the site itself offers for other businesses.

When asked what North Dakota can do, Weeda shared we certainly want to do anything we can to keep our existing resources operating through a business-friendly policy and environmental considerations. He stated the wind capacity factor in North Dakota is high but even at that, it is about a 50% capacity factor. He is encouraging wind developers to “firm up” renewable generation. Weeda shared an example of how this could be done is with a gas turbine and wind farm so there would be an alternative for when the wind is not blowing. This would allow a product that is firm no matter if the wind is blowing and would be more valuable to the utilities that would receive it.

V. GRANT ROUND XCIII (94) APPLICATIONS

LRC-XCIV (94)A: Systematically Applied Research to Develop High Value Products from Coal

Submitted by: Semplastics EHC LLC and Affiliates

Principal Investigator: Walter Sherwood & William Easter

Project Duration: 24 months

Request for: \$300,000

Total Project Costs: \$3,279,756

Holmes shared the proposed effort is comprised of four different sub-projects that integrate coal and coal ash into safe and strong building materials. The technological target is to provide new improved building materials out of lignite-based resources. The ultimate goal would be to produce an entire building comprised primarily of lignite-derived building materials. The economic impact is to provide additional markets for lignite-based resources. The underlying benefit of the project is to create value-added coal-based products. The four projects are to be completed over a two-year time frame. The total budget is \$3.3 million with \$300,000 being sought from the North Dakota Industrial Commission. The majority of the money would come from the U.S. Department of Energy with other funds coming from Semplastics as well as other research partners.

Holmes said the three technical peer reviewers gave the proposal an average weighted score of 207.3 out of 250 points. The weighted score was 230 out of 250 points from reviewer 24-01, 157 out of 250 points from reviewer 24-02, and 235 out of 250 points from reviewer 24-03. Technical peer reviewers 24-01 and 24-03 recommended **fund** and technical peer reviewer 24-02 recommended **funding may be considered** for the project.

As the Technical Advisor for this project, Holmes recommended **fund** based on two of the technical reviewers’ feedback to fund and the third to recommending funding may be considered. Holmes stated that he felt the proposed project is a great fit for the Lignite Research Program as a pursuit of emerging markets for building materials from lignite and ash. Holmes also shared that the project provides a strong leverage of State funding at roughly 10:1.

Holmes shared that funding would be subject to the Technical Advisor participating in project reviews, reviewing the project management plan with the project team and receipt of the industry and federal matching funds.

Holmes shared conflicts of interest to include EERC, North American Coal and BNI Coal.

William Easter, Semplastics, presented on behalf of the applicant. (A copy of the Power Point presentation is available in the LRP files.)

LRC-XCIV (94)B: To test, confirm, and initiate commercial design of a post-combustion “bolt-on” CO₂ capture system suitable for at-scale...

Submitted by: Mattoon Power Enterprises, LLC

Principal Investigator: Paul Gandola

Project Duration: 9 months

Request for: \$375,000

Total Project Costs: \$750,000

Holmes shared with the committee that Mattoon Power Enterprises, LLC (MPE), was previously awarded funding (May 2018) to demonstrate their CO₂ capture system, but there were challenges with the finalizing the host site. MPE is now performing a demonstration of their technology at a natural gas fired unit funded by a consortium in Cleveland, Ohio. This proposal to the Lignite Research Program is for development of a gas-liquid mixing system to reduce the cost of using solutions to capture carbon dioxide from existing coal-based power plants. Because of the funding and partner changes the NDIC will need to consider revision of the scope and funding of this project.

Holmes said the three technical peer reviewers gave the proposal an average weighted score of 163 out of 250 points. The weighted score was 135 out of 250 points from reviewer 24-04, 187 out of 250 points from reviewer 24-05, and 167 out of 250 points from reviewer 24-06. Technical peer reviewers 24-04 and 24-06 recommended **do not fund** and technical peer reviewer 24-05 recommended **fund** for the project.

As the Technical Advisor for this project, Holmes recommended **do not fund** based on two of the technical reviewers recommended do not fund, and the third recommended funding. The proposed project focuses on technology that could provide improved mixing for CO₂ capture systems, but the reviews noted a need for more North Dakota support. While the reviews noted strengths in the team and technology, it was noted that testing was to be performed in Cleveland, OH on a natural gas fired system. Again, the reviews recommended gaining North Dakota lignite industry support and identifying an opportunity for lignite fired demonstration prior to funding.

Holmes shared that funding would be subject to receipt of matching funds with support from North Dakota Lignite Industry, followed by review of the final budget by the LRC Executive Committee. Holmes shared funding would also be subject to the Technical Advisor participating in project reviews and review the project management plan with the project team.

Holmes said there were no conflicts of interest identified.

Paul Gandola, Mattoon Power Enterprises, LLC presented on behalf of the applicant.

LRC-XCIV (94)C: Lignite-Derived Carbon Materials for Lithium-Ion Battery Anodes

Submitted By: Institute for Energy Studies, University of North Dakota (UND)

Principal Investigator: Xiaodong Hou

Project Duration: 24 months

Request for: \$75,000
Total Project Costs: \$667,465

Holmes shared with the committee that the UND Institute for Energy Studies is teaming up with Clean Republic LLC and The North American Coal Corporation to develop a high-value product from lignite-derived carbon materials. The goal of this project is to develop and demonstrate an economic process for production of advanced composite anode materials for lithium-ion batteries using lignite-derived pitch and synthetic graphite as the main feedstock. Development of battery materials manufacturing in the state would use North Dakota-based feedstocks and processes for high potential of new industrial growth. The overall cost of the project is \$667,000 and the project sponsors are seeking \$75,000 from the Lignite Research Program. The other funding sources include the U.S. Department of Energy along with North American Coal and Clean Republic.

Holmes said the three technical peer reviewers gave the proposal an average weighted score of 217.7 out of 250 points. The weighted score was 199 out of 250 points from reviewer 24-07, 209 out of 250 points from reviewer 24-08, and 245 out of 250 points from reviewer 24-09. Technical peer reviewers 24-07, 24-08, 24-09 recommended **fund** for the project.

As the Technical Advisor for this project, Holmes recommended **fund** based on all three technical reviewers' feedback to fund. Holmes shared that the proposed project fits the Lignite Research Program, and the lignite industry road map by providing the potential for a value-added product through the production of battery components from lignite. The project provides a strong leverage of State funding with DOE federal and industry support.

Holmes shared that funding would be subject to the Technical Advisor participating in project reviews, reviewing the project management plan with the project team and confirmation of receipt of the industry and federal matching funds.

Holmes shared conflicts of interest to include North American Coal.

Xiaodong Hou, Institute for Energy Studies, UND presented on behalf of the applicant. (A copy of the Power Point presentation is available in the LRP files.)

LRC-XCIV (94)D: Annual Lignite Energy Council Education Program

Submitted By: Lignite Energy Council
Principal Investigator: Kay LaCoe
Project Duration: 24 months
Request for: \$200,000
Total Project Costs: \$412,000

Karlene Fine stated that the applicant is requesting funding for two 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. Of specific note is the new Lignite Learn (an E-Campus) which will continue moving forward with the development of a two-pronged website aimed at laying the foundation for an e-learning option for the Lignite Education Seminar.

Fine's Executive Director Recommendation was to **fund**. The two technical reviewers recommended funding and provided positive comments about the objectives, achievability, methodology, contribution, awareness/background of the principal investigators, equipment and facilities and the budget.

Fine shared the conflicts of interest are the Lignite Energy Council and members of the Lignite Energy Council.

Kay LaCoe, Lignite Energy Council presented on behalf of the applicant. (A copy of the Power Point presentation is available in the LRP files.)

LRC-XCIV (94)E: Electrostatic Filtration of Large Lubricant Reservoirs

Submitted By: Institute for Energy Studies, University of North Dakota (UND)

Principal Investigator: Junior Nasah

Project Duration: 12 months

Request for: \$151,494

Total Project Costs: \$350,948

Holmes shared that the proposed project involves development of a small and affordable electrostatic oil cleaner system that will allow power plant equipment to operate with a lower risk of failure due to contamination. The technology is intended to lower maintenance costs, extend lubricant lifetime, reduce wasted oil, and decrease downtime. Onsite field testing will be conducted at the Coyote Station and the Leland Olds Station. The UND Institute for Energy Studies and the Electrostatic Lubrication Filtration (ELF) company will perform the proposed work. The total budget is \$350,948, with \$151,494 requested from the Lignite Research Program. That amount will be matched with cash and in-kind contributions.

Holmes said the three technical peer reviewers gave the proposal an average weighted score of 190 out of 250 points. The weighted score was 188 out of 250 points from reviewer 24-10, 180 out of 250 points from reviewer 24-11, and 202 out of 250 points from reviewer 24-12. Technical peer reviewers 24-10 and 24-11 recommended **funding may be considered**. Technical reviewer 24-12 recommended **fund** for the project.

As the Technical Advisor for this project, Holmes recommended **fund** based on two of the technical reviewers recommending funding may be considered and the third recommending to fund. The proposed project is a fit for the Lignite Research Program, as a "small research" project that can reduce capital and operating costs for rotating equipment at the power plants. The project team includes hosting technology tests at two of ND's power plants.

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

Holmes said conflicts of interest include Basin Electric and Ottertail Power.

Junior Nasah and Nicholas Dyrstad-Cincotta, Institute for Energy Studies, UND and James Rickson, ELF CEO, presented on behalf of the applicant. (A copy of the Power Point presentation is available in the LRP files.)

Incremental Budget Approval for PCOR

FY20-XCI-226; Request for project incremental funding of \$500,000 of the previously approved \$2,000,000 based on additional scope of work and receipt of match funding.

Submitted By: Energy and Environmental Research Center (EERC)

Principal Investigator: Kevin Connors

Project Duration: 5 years

Total Project Costs: \$12,504,348

The EERC through its Plains CO₂ Reduction (PCOR) Partnership – is working with partners in the lignite industry to secure the second \$500,000 increment of lignite research program funding from the previously approved \$2,000,000. This is based on additional scope of work and receipt of matching funds. The goal of this project is to accelerate and facilitate the buildout of CCUS infrastructure in North Dakota and neighboring states. The PCOR Partnership includes the primary players in North Dakota’s lignite industry who have been working with the EERC over the last 16 years to validate the technical and economic viability of CCUS technology. This new project – which will be largely funded by the DOE – will benefit North Dakota by working towards monetizing recently passed Federal legislation that provides tax credits for energy companies to capture and geologically store CO₂. This phase of the project is planned for a five-year time frame.

Holmes shared his Technical Advisors recommendation to **fund** the “second” \$500,000 based on receipt of the additional federal funding. The three technical reviewers originally recommended funding with an average score of 229.3 out of 250 and facilitating commercial CCUS is a primary focus for sustaining use of our vast lignite reserves. Carbon management is a primary focus of the lignite industry R&D Roadmap and the Lignite Research Program and the project was previously approved. The project would continue to provide strong leveraging of NDIC funding.

Holmes shared that funding would be subject to the Technical Advisor participating in project reviews. Incremental remaining \$1.0 million contingent upon receipt of additional DOE and industry funding at the initial match rate.

Holmes said the conflicts of interest include EERC and most of the lignite industry as PCOR partners.

Kevin Connors, EERC presented on behalf of the applicant. (A copy of his Power Point presentation is available in the LRP files.)

VI. 2020 CALENDAR

Bohrer announced that the next LRC meeting is scheduled for May 13, 2021. Bohrer reminded the group that the upcoming grant application deadline is April 1, 2021.

VII. OTHER BUSINESS

Voting: Due to the meeting being done in a WebEx format and not in person, there was two options for voting. A confidential email sent from a third-party voting site called Simply Voting was sent to the present voting members. The group also had the option to email Karlene Fine, ND Industrial Commission directly with their vote.

Adjournment: There being no further business, Bohrer requested a motion for adjournment of the LRC meeting. John Phillips so moved; seconded Wade Boeshans. Motion carried.

GRANT ROUND XCIV (94) Ballot Results: Jason Bohrer announced (via email) following the meeting the results of the ballots concerning the LRC’s recommendations to the NDIC for the Grant Round XCIV (94) proposals as follows...

LRC-XCIV (94)A: Systematically Applied Research to Develop High Value Products from Coal

Submitted By: Semplastics EHC LLC and Affiliates
Principal Investigator: Walter Sherwood & William Easter
Project Duration: 24 months
Request for: \$300,000
Total Project Costs: \$3,279,756

Fund: 18 Do Not Fund:0 Abstain: 0

LRC-XCIV (94)B: To test, confirm, and initiate commercial design of a post-combustion “bolt-on” CO₂ capture system suitable for at-scale...

Submitted By: Mattoon Power Enterprises, LLC
Principal Investigator: Paul Gandola
Project Duration: 9 months
Request for: \$375,000
Total Project Costs: \$750,000

Fund: 6 **Do Not Fund: 12** Abstain: 0

LRC-XCIV (94)C: Lignite-Derived Carbon Materials for Lithium-Ion Battery Anodes

Submitted By: Institute for Energy Studies, University of North Dakota (UND)
Principal Investigator: Xiaodong Hou
Project Duration: 24 months
Request for: \$75,000
Total Project Costs: \$667,465

Fund: 18 Do Not Fund: 0 Abstain: 0

LRC-XCIV (94)D: Annual Lignite Energy Council Education Program

Submitted By: Lignite Energy Council
Principal Investigator: Kay LaCoe
Project Duration: 24 months
Request for: \$200,000

Fund: 18 Do Not Fund: 0 Abstain: 0

LRC-XCIV (94)E: Electrostatic Filtration of Large Lubricant Reservoirs

Submitted By: Institute for Energy Studies, University of North Dakota (UND)

Principal Investigator: Junior Nasah

Project Duration: 12 months

Request for: \$151,494

Total Project Costs: \$350,948

Fund: 14

Do Not Fund: 2

Abstain: 2

Incremental Budget Approval for PCOR

FY20-XCI-226; Request for project incremental funding of \$500,000 of the previously approved \$2,000,000 based on additional scope of work and receipt of matching funding.

Fund: 18

Do Not Fund: 0

Abstain: 0

The North Dakota Industrial Commission meeting, when these recommendations will be considered, will be held on November 23, 2020.

Angie Hegre, recording secretary