

Lignite Energy Council Education Program

**Grant Submitted by
Lignite Energy Council**

**Principal Investigator
Lignite Energy Council**

**Grant Deadline: April 1, 2023
Amount Requested: \$450,000**

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Abstract

The Lignite Energy Council's (LEC) Education Program continues to build on the ongoing success of the more than thirty years of the Lignite Education Seminar as well as education initiatives to educate teachers and students about the regional lignite industry including energy production and the economic and environmental impacts of lignite.

Through the Lignite Energy Council's Lignite Education Seminar, Lignite Learn E-Campus, and other education-focused outreach efforts, the expected outcomes of the Education Program include:

- Improved perception of lignite coal as an energy resource;
- Increased awareness of the regional lignite economy; and
- Increased understanding of future growth opportunities within the lignite industry.

These outcomes will be achieved through deliverables that facilitate open communication and awareness, expand the use of educational hands-on activities in classroom settings, and through providing multi-day, expert-level education for teachers and administrators.

Ultimately, the Lignite Education program achieve the overarching goal of educating teachers and students about the lignite industry in the region.

The funding request is for a three-year program with a project start date of April 1, 2023 to allow the ongoing work of industry and the Lignite Energy Council to be included in the overall scope. The total budget for the Education Program as described is \$908,000, of which \$450,000 is requested from the Lignite Research Council. The matching funding for the Education Program comes from the Lignite Energy Council and in-kind services from the Lignite Energy Council and representatives of the lignite industry.

Project Summary

The goal of the Lignite Education Program is to educate teachers and students about the lignite industry through in-person connection, community outreach events, and online educational and awareness opportunities. Ensuring the Program invests resources in multiple avenues and mediums is crucial in ensuring that many subsets of the target audience is reached, and that the message is reinforced through repetition and various delivery modalities.

The flagship piece of the Education Program has long been the Lignite Education Seminar. The four-day Seminar, which is held each June in Bismarck, includes tours of mines, power plants, and other coal-related facilities along with instruction on issues such as history, geology, mining and reclamation, the conversion of lignite to electricity or synthetic natural gas, and the economics of the lignite industry. The seminar also includes panel discussions and presentations regarding industry-related career opportunities, environmental challenges, transmission needs and research and development topics.

Education about the regional lignite industry is essential in fostering a positive and favorable view of the industry which is rooted in facts, which aids in favorable regulatory, business and career climates for the industry. Access to educational opportunities and easily consumable industry information is crucial in providing awareness about the industry, especially with younger generations. Teaching the teachers and providing them with accurate information about lignite coal and the positive impacts of the industry on North Dakota and the region ensures that they are providing accurate instruction to their students.

This grant application will expand the timeline of the grant to a three-year initiative, allowing for continued flexibility due to technological upgrades, including the ability to educate teachers and students with up-to-date materials reflecting any potential regulatory or other changes. The expanded grant also shows a commitment to continued education regarding lignite coal as an energy resource for today and tomorrow. The expanded timeline will also allow for investments in Year 1 (including encumbered expenses to be included as Year 1 match) that will positively impact the effectiveness of the program in Year 2 and Year 3.

Project Description

Over the past several years, the Lignite Energy Council, with support from the Lignite Research Council and industry partners have continued to expand the impact and breadth of its educational efforts through digital assets and community outreach initiatives. Targeted audiences include community groups, business leaders, and potential lignite industry employees. As planning continues to broaden the reach and impact of the Lignite Education Program and Lignite Education Seminar, this budget will reflect similar opportunities to remain flexible with the program and broaden its impact in response to any changing conditions.

The ability to reach and impact more educators and students through the Education program will be increased through the purchase and implementation of a management software system, which will add value to the program, improve management efficiencies, and serve as a platform for wider dissemination of educational resources to teacher and students.

Opportunities to engage in continued educational programming to these identified communities will be within the scope of this application, including those outlined below:

- Lignite Education Seminar
- Educational Video Series
- Lignite Education Foundation and License Plates
- STEM Technology Grant
- Lignite Learn
- Direct community and school engagement

Lignite Education Seminar

Future Lignite Education Seminars are scheduled to be held at the National Energy Center of Excellence on the campus of Bismarck State College in Bismarck, ND, on June 12 – 15, 2023, June 10 – 13, 2024, and June 9 – 12, 2025. The annual Seminar has historically attracted educators primarily from a four-state area – North Dakota, South Dakota, Minnesota and Montana. School superintendents, principals and teachers of all grade levels from elementary to senior high are encouraged attend the four-day Seminar. Approximately 75 - 110 educators attend annually.

Teachers attending the Seminar will create lesson plans based on their learning from the event, with the intention that they use these lesson plans in their classrooms. Through a new online platform, teachers will begin to have the opportunity to share completed lesson plans with others who have attended the Seminar, increasing the impact of the Seminar outcomes back in the classroom for years to come.

Lignite Educational Video Series

In 2017, the Lignite Energy Council, with support and matching grant funding from the Lignite Research Council began work on a four-part video series. To date, three videos have been completed and are available for viewing on the Lignite Energy Council YouTube account as well as being featured at the North Dakota Heritage Center. The videos are also made available to

teachers via the Lignite Education Seminar – Teachers website. The videos are aimed to match the four major areas of the Lignite Education Seminar as well as match with information presented in the North Dakota Studies Energy Curriculum.

- Lignite 101: An Introduction: <https://youtu.be/8Ucg5hzyvQ>
- Mining & Reclamation: <https://youtu.be/QLinfDcZez4>
- Coal Conversion and Electricity Production: <https://youtu.be/aJL8yxOJjOo>
- Environmental Impacts & Stewardship: currently in production

These videos will continue to be maintained and updated as needed.

[Lignite Education Foundation and License Plates](#)

The LEC also established a charitable 501(c)(3) organization. The Foundation provides funds for educational programs and activities which educate about the coal industry, processes, and economic impact; promote industry-related career opportunities; and aim to facilitate opportunities to actively engage students with the industry.

One program that the Lignite Energy Council is most proud of is the North Dakota license plate program. Funding for the scholarship program is derived, in part, through a special-interest license plate available from the North Dakota Department of Transportation. Today, more than \$15,000 has been raised through the license plate program.

[STEM Technology Grant](#)

While teachers play a valued role in sharing information learned during the Seminar with students, the educational leaders and career counselors in schools play a vital role in the eventual college-and-career search that students undergo. Therefore, the Lignite Energy Council sought to target school principals and career counselors through the offering of a STEM technology grant.

The grant was successfully awarded once, to an elementary principal and counselor from Strasburg Public School, who used the grant to implement LEGO Robotics at the school. Future administrator/non-teacher attendees at the Seminar will be invited to enter to win a \$1,000 STEM Technology Grant for their school or district, awarded from the Lignite Energy Foundation.

[Lignite Learn](#)

While the COVID-19 pandemic presented many challenges to the Seminar, it did present a unique opportunity to initiate work and the preliminary substantial investment in an online learning hub for educators and students. Work began on developing additional resources to further the impact of the in-person Seminar.

These resources include:

- I. Lignite Learn Interactive Courses

Plan, create, design and develop an interactive learning management system which will host courses for students and teachers. Courses will be primarily interactive in learning approach with elements that attract and appeal to 4 – 8th grade learners as a target audience.

This portion was completed and resources are available online at learn.lignite.com

II. Teacher Online Refresher Course

Create an online course for teachers to refresh their in-person learning experience from a past seminar attendance. Each lesson will aim to capture the experience of the live course by providing engaging presentations offered by subject matter experts in the field. Four of five courses are built and are currently in the review stage. Content for the fifth course is under development. Once all are complete, these interactive courses will be marketed to teachers for use in their classrooms.

Targeted Completion: March 31, 2023

III. Teacher Activity Kits

Develop and share classroom lesson plans and activity resources directly to teachers for use in the classroom. Kits have been completed and are currently in an ongoing distribution process.

Targeted Completion: October 31, 2023

The expanded scope of this grant will allow for further enhancements and developments in the Lignite Learn project. Content and information in Lignite Learn will continue to be updated and maintained throughout the duration of the program. Additional modules of the project will be developed and deployed, including:

I. Lignite Learn Curriculum

Design and develop stand-alone Lignite-focused lesson plans for easy deployment in the classroom. These lesson plans will be available as a resource for virtual learning days as needed due to illness or weather-related closures, or as a resource for substitute teachers.

II. Guest Presentations

Implement stand-alone hands-on classroom activities to be proctored by the Lignite Energy Council Education Director or other individual when requested by schools or other student-focused groups.

Direct Community and School Engagement

Career exploration opportunities have become a popular way for schools to expose students to opportunities after high school. School leaders often offer such programs to middle and high school students. Some school districts employ “Career Advisors” in addition to traditional school counselors, and all North Dakota high schools are required to provide two units of career and technical education to students.

This emphasis on hands-on, career-oriented learning opportunities frequently results in teachers looking for guest presentations and activities provided by industry experts. Through the Education Program, the Lignite Energy Council will be able to be a resource to facilitate in-person engagement with schools and other community groups such as the Boy Scouts of America or after-school STEM clubs when requested.

Standards of Success

Success of the Education Program is evaluated based on the objectives and outcomes of the goal of the program: Educate regional teachers and students about the lignite industry in the area.

Objectives

- Increase awareness of the regional lignite industry among teachers, administrators and students.
- Improve the favorability of the regional lignite industry among teachers, administrators and students.
- Demonstrate improved understanding of the regional lignite industry among teachers, administrators and students.

Deliverables

- Produce a multi-day, in-person Lignite Education Seminar which provides expert-level instruction on the facets of energy, economics and the environmental impacts of the regional lignite industry.
- Add and expand Lignite Learn student activities that educate about energy, economics and the environmental impacts of the regional lignite industry.
- Add and expand digital and online consumable assets such as videos, graphics and lesson plans which educate about energy, economics and the environmental impacts of the regional lignite industry.
- Provide avenues for dialog and open communication between target audiences and industry personnel such as tours and panels.
- Identify and promote job and career opportunities in the regional lignite industry.

Outcomes

- Participation of 75 educators and/or administrative staff in the Lignite Education Seminar
- Facilitate or provide quarterly in-person educational activities to teachers, students or student groups.
- Target audience will be able to demonstrate more than 70% comprehension of sources of energy/electricity and pros/cons of each.
- Target audience will indicate more than a 70% agreement that coal is vitally important to our region's power supply.
- Target audience will report more than a 70% favorability of the use of coal to produce electricity.
- Target audience will be able to identify possible career paths available.

As online tools and Lignite Learn online resource are implemented into the Education Seminar as well as classroom use, the Lignite Energy Council anticipates additional areas of measurement as well as improvements in the program's overall outcomes.

Background

The Lignite Energy Council has been offering the Seminar since 1986. The Seminar will be coordinated and reviewed by Retha Mattern, Education & Membership Director with the Lignite Energy Council. Retha will also serve as the Instructor of Record for the Seminar, eliminating the need for an outside faculty contract. The various presenters work in the industry and speak from experience on their various topics.

Each participating teacher is eligible to receive two graduate credits, paid for by the Lignite Energy Council, from the North Dakota University System (UND, NDSU and Minot State University) upon the completion of the Seminar and submission of a lesson plan. Teachers also receive ancillary information for classroom work including classroom activities, videos about generation, mining and reclamation and samples of coal and coal combustion byproducts.

The Seminar focuses on sending teachers home with practical and applicable information and classroom tools. It places an emphasis on technology and hands-on learning to help the teachers prepare lesson plans. The anticipation is that teachers will implement these activities in their own classroom and share them with peers, increasing the reach and impact of the Education Program.

More than 3,500 teachers representing more than 600 schools have completed the Seminar. As a direct result, an estimated 60,000+ students have received some education about lignite and its role in the regional economy every year. More than 750 teachers have attended from out of state.

Recruitment

Each year, the Seminar's administrator works closely with recruitment representatives from electric utilities with customers in targeted states. The Lignite Energy Council provides these recruiters with printed and electronic promotional material. The recruiters then assist in disseminating information about the Seminar to schools and teachers within their service territories. Applicants are directed to the Lignite Energy Council's website (<https://www.lignite.com/teachers>) to complete an online application.

Recruitment in North Dakota consists of a printed direct-mail poster and letter sent to 2,000 licensed teachers in the state, followed by a recruitment postcard. The Lignite Energy Council also engaged in a multi-phased email campaign encouraging attendance. Emails were directed towards teachers and administrators, with administrators also receiving a digital poster to print and display. Teachers in Minnesota who are served by member cooperatives were targeted through a three-part email campaign, as well as through targeted digital ads including video ads on social media.

Seminar Attendance

Accommodations are made at Bismarck State College to house teachers in dorm rooms on campus. This cost is paid for out of the Seminar budget. Sponsorships are available for transportation reimbursement to and from the Seminar for eligible teachers in Montana, South Dakota, Minnesota and Iowa. North Dakota teachers are responsible for their own transportation costs to and from the Seminar but are eligible for housing during the Seminar.

The Seminar is open to those who teach kindergarten through 12th grade, or are administrators at such schools, from North Dakota, South Dakota, Minnesota or other states where North Dakota lignite-based electricity is used. Teachers are accepted on a first-come, first-served basis; however, preference may be given to those who teach math, science or social studies.

As part of the industry's in-kind contribution, North Dakota and Minnesota cooperatives and investor-owned utilities provide sponsorships for out of state teachers to attend. These sponsorships typically cover transportation and meal costs incurred during travel to and from the Seminar. Additionally, industry devotes more than 150 hours for recruitment, activities, Seminar presentations and tours.

Qualifications

The Lignite Energy Council will be responsible for managing the Seminar. The Lignite Energy Council is a regional trade association representing the interests of producers and users of lignite and conducts programs in four separate areas including: government action; research and development; public relations and marketing; and education. Through these programs, the Council seeks to maintain a viable lignite industry and enhance development of North Dakota's abundant lignite resources in a clean, economical and efficient manner. These programs provide timely, accurate information that enables elected officials, government leaders and the public to make sound, informed decisions on lignite issues.

Retha Mattern joined the Lignite Energy Council in September 2022 as the Education & Membership Director. Retha holds a Master of Science in Management from Minot State University and a Bachelor of Arts in Journalism from the University of Maryland, College Park. Retha previously worked in higher education as the Admissions Director at Bismarck State College, the Business Outreach Coordinator for the college's National Energy Center of Excellence, and as the Director of the Great Plains Energy Corridor. Retha also served on the North Dakota State Board of Higher Education from 2019-2022. Retha will serve as the lead instructor for the Seminar in 2023.

Kay LaCoe serves as the Vice President of Marketing & Communications for the Lignite Energy Council. Kay has a Bachelor of Science Degree in Business Communications from the University of Mary, where she is also completing a Master of Organizational Leadership. She worked extensively with the Seminar since 2008 and served as the program administrator and project manager from 2014-2022.

Representatives of the Lignite Energy Council who also serve as presenters at the Seminar include:

- **Jason Bohrer** serves as President and CEO of the Lignite Energy Council. He also serves as the Chairman of the Lignite Research Council (LRC) which includes government, research, environmental and industry representatives. The LRC assists with development and administration of North Dakota's Lignite Research, Development and Marketing Program by providing recommendations to the Industrial Commission.
- **Mike Holmes** joined the Lignite Energy Council in December 2016 as the vice president of research and development. He had been the director of Energy Systems Development at the Energy & Environmental Research Center (EERC) in Grand Forks, where he oversaw fossil energy research areas. His principal areas of interest and expertise include CO₂ capture; fuel processing; gasification systems for coproduction of hydrogen, fuels, and chemicals with electricity; process development and economics for advanced energy systems; and emission control technologies. Prior to his work at EERC, Holmes spent 15 years working on coal-related research and development and commercial

projects for Babcock & Wilcox, a major supplier of advanced energy and environmental technologies for the power industry. He received a Master of Science degree in chemical engineering from the University of North Dakota and a Bachelor of Science degree in chemistry and mathematics from Mayville State University. He is a member of the National Coal Council and has been an Executive Member and served on the Board of Directors of the Fuel Cell and Hydrogen Energy Association.

In addition to Lignite Energy Council staff, the LEC relies on the expertise provided by industry and education representatives to provide the bulk of instruction for the Seminar.

Value to North Dakota

The North Dakota Legislature has a long history of supporting the lignite energy industry. Specifically, the North Dakota Legislature has enacted legislation which “ ... declares that it is an essential government function and public purpose to assist with the development ... of North Dakota’s vast lignite resources ... in order to maintain and enhance development of North Dakota lignite and its products; preserve and create jobs involved in the production and utilization of North Dakota lignite; ensure economic stability, growth and opportunity in the lignite industry; and maintain a stable and competitive tax base for our state’s lignite industry for the general welfare of North Dakota ... ”

The lignite energy industry is vital to North Dakota’s economic health. Annual lignite production has been approximately 30 million tons since 1988, making North Dakota one of the 10 largest coal producing states in the nation. In 2019, an NDSU economic study showed that 3,800 North Dakotans are directly employed in the lignite industry and another 10,200 indirectly. The industry is expected to generate almost \$5.7 billion in annual business activity, as well as \$130 million in annual local and state tax revenues.

This Education Program is part of the larger LEC mission which seeks to:

- Preserve and create jobs involved in the production and utilization of North Dakota lignite;
- Ensure economic stability, growth and opportunity in the lignite industry; and
- Maintain a stable and competitive tax base for North Dakota’s lignite industry for the general welfare of North Dakota.

The Program will also curate and share content gleaned through the program’s administration with other efforts in which the Lignite Energy Council engages, furthering the impact of information, curriculum, and resources developed through the Program.

Management

The Lignite Energy Council will manage and oversee the Seminar and its Board of Directors has authorized the program and budget. Retha Mattern, Education & Membership Director, is the primary person responsible for the Seminar and will also serve as the Instructor of Record for the Seminar. Retha reports to Jason Bohrer, President and CEO of the Lignite Energy Council.

The University of North Dakota, North Dakota State University and Minot State University have approved the program for eligibility of two graduate credits for the Seminar. The Seminar will be held on the campus of Bismarck State College in Bismarck, ND, with options for housing and meals for participants facilitated through the campus as needed.

Timetable

The Lignite Energy Council's Teacher Education Program described in this grant request runs from April 1, 2023 through March 31, 2026.

Budget

The Lignite Energy Council's Teacher Education Program grant budget, including in-kind services, from April 1, 2023, through March 31, 2026 is \$908,000.

The Education Program budget encompasses four main areas – expenses for program management; expenses for the Seminar logistics, venue and Seminar management; expenses for professional services; and expenses regarding the outreach of the program.

Items within the budget include, but are not limited to the following:

- Program Management:
 - Includes 50% of the program director's pay and benefits,
 - Costs for expanded educational community outreach opportunities,
 - Costs related to implementation of an administrative software system for improved program management and seminar participant registration.
- Teachers Education Seminar Logistics and Venue:
 - Facility rental fees,
 - Recruitment efforts,
 - Attendee transportation and meals,
 - Speaker fees,
 - Attendee credits.
- Professional Services
 - 50% of professional services provided by Kent Ellis, the North Dakota Energy Career Awareness Coordinator. Mr. Ellis provides expertise, advisement, speaking, in-classroom presentations and curriculum development for the Education Program.
- Program Materials, Supplies & Digital Assets
 - All classroom materials available to teachers or used in class facilitation,
 - Website and Lignite Learn development and maintenance,
 - Maintenance and creation of video and/or digital assets,
 - Program expansion efforts.



Lignite Energy Council Education Program Budget

3/7/2023

| Income | | | | |
|--|------------------|-------------------|---------------------|------------------|
| | LRC Share | Applicant's Share | Applicant's In-Kind | |
| Program Management & Seminar Logistics | \$383,000 | \$300,000 | \$75,000 | \$758,000 |
| Professional Services | \$34,000 | \$41,000 | | \$75,000 |
| Program Materials | \$33,000 | \$42,000 | | \$75,000 |
| TOTAL | \$450,000 | \$383,000 | \$75,000 | |
| TOTAL PROGRAM EXPENSES | | | | \$908,000 |
| | | | | |
| Grant Request | \$450,000 | | | |
| Lignite Energy Council | \$383,000 | | | |
| Industry In-Kind | \$75,000 | | | |
| TOTAL PROGRAM FUNDING | | | | \$908,000 |
| | | | | |
| Expenses | | | | |
| | | | | |
| 1 Program Management | <i>3 years</i> | | | |
| LEC Administrative Expenses (Labor & Equipment) | \$387,000 | | | |
| LEC Administrative Software | \$199,200 | | | |
| Additional Staff Resources & Contingency (Labor) | \$6,000 | | | |
| | | \$592,200 | | |
| 2 Teachers Education Seminar Logistics and Venue | <i>3 years</i> | | | |
| Recruitment (Materials & Services) | \$21,000 | | | |
| Facility Rental (Fees) | \$39,800 | | | |
| Meals | \$50,000 | | | |
| Credits (Fees) | \$24,000 | | | |
| Programming (Fees, Transp., Meals & Services) | \$31,000 | | | |
| | | \$165,800 | | |
| 3 Professional Services (Labor) | <i>3 years</i> | | | |
| ND Energy Career Awareness Program | \$75,000 | | | |
| | | \$75,000 | | |
| 4 Program Materials, Supplies & Digital Assets | <i>3 years</i> | | | |
| | | \$75,000 | \$908,000 | |

Matching funds

The Lignite Energy Council and its members will provide in-kind services and funding of at least \$450,000 over three years to match the Industrial Commission's funding of up to \$450,000 for three years. Total funding requested for the three-year period is \$450,000, which will be matched by the Lignite Energy Council and its members.

Tax liability

I, Retha Mattern, certify that the Lignite Energy Council is not delinquent on any tax liability owed to the State of North Dakota.

Confidential information

No confidential information is included in this proposal.

Retha Mattern, Education & Membership Director
Lignite Energy Council