

Annual Lignite Energy Council Education Program

**Grant Submitted by
Lignite Energy Council**

**Principal Investigator
Lignite Energy Council**

**Grant Deadline: October 1, 2020
Amount Requested: \$200,000**

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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 primarily teachers and students about the regional lignite industry including energy production, economics and environmental impacts of lignite on the region.

With support from the Lignite Energy Council's Lignite Education Seminar, Lignite Learn E-Campus and other outreach efforts, the expected outcomes of the Education Program include:

- improved perception;
- improved comprehension; and
- increased awareness of job opportunities of the regional lignite industry.

These outcomes will be achieved through deliverables that facilitate open communication, encourage participation educational hands-on activities and provide 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 two-year program. The total budget for the Education Program as described is \$412,000, of which \$200,000 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, community outreach and online educational and awareness opportunities. Ensuring that the Program invest resources in multiple avenues and mediums is crucial in ensuring that as many subsets of the target audience is reached.

Education about the regional lignite industry is essential in fostering a positive or favorable view of the industry which also aids in favorable regulatory, business and career climates for the industry. Access to educational opportunities and easily-consumable industry information is crucial in furthering awareness about the industry, especially with younger generations.

The flagship piece of the Education Program has been the Lignite Education Seminar. The four-day Seminar, which is held each June, includes tours of mines and coal conversion facilities along with presentations and panel discussions on a number of relevant issues including history, geology, mining and reclamation, converting lignite to electricity, converting lignite to synthetic natural gas, economics of the lignite industry, career opportunities, environmental challenges, transmission and research and development topics.

Over the past several years, the Lignite Energy Council, with support from the Lignite Research Council and industry partners, has expanded the impact and breadth of its educational efforts through digital assets, community outreach initiatives and preliminary E-Campus developments.

Due to rising concerns regarding the COVID-19 pandemic the decision was made to cancel the 2020 Lignite Education Seminar and re-focus available funds. Budgetary flexibility and a re-budget allowed the LEC to plan, create, design and develop the preliminary stages of an interactive learning management system for teachers and students. Additionally, the re-budget allowed for the preliminary creation of an online course for teachers that will supplement the Lignite Education Seminar and Education Program. As planning continues to broaden the reach and impact of the Lignite Education Program and Lignite Education Seminar amid COVID uncertainties, the budget (page 8) will reflect similar opportunities to remain flexible with the program.

Opportunities and assets funded and created through the partnerships in education over the past several years include:

- Lignite Educational Video Series
- NdEATO Trunks
- Lignite Education Foundation and License Plates

- STEM Technology Grant
- Lignite Learn (preliminary)

Lignite Education Seminar

The 2021 and 2022 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 14 – 17, 2021 and June 13 – 16, 2022. The annual Seminar attracts 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 attend the four-day Seminar. Approximately 75 - 110 educators attend annually.

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 that would produce one video each year through 2020. 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/8Ucg5hzyvvQ>
- Mining & Reclamation: <https://youtu.be/QLinfDcZez4>
- Coal Conversion and Electricity Production: <https://youtu.be/aJL8yxOJjOo>
- Environmental Impacts & Stewardship: currently in production

North Dakota Energy Activities (NdEATO) Trunks

The Lignite Energy Council collaborated with the State Historical Society of North Dakota to create North Dakota Energy Activities Trunk with Objects (NdEATO). The trunks include all of the materials necessary to conduct hands-on activities in the classroom such as:

- Energy efficiency and loss
- Magnetism
- Energy generation
- Caking coal mining and reclamation
- Varieties of coal

Currently, the NdeATO trunks are available to teachers that are able to pick up the trunk versus shipping to schools due to constraints on shipping certain items (such as denatured alcohol) contained in the trunk. A plan is being developed with teacher resources centers across the state to make trunks available in other districts; however, those discussions have been halted due to COVID concerns.

The NdeATO trunk contents go hand-in-hand with Energy: Powered by North Dakota energy curriculum, a product of the EmPower ND Commission. Additionally, the activities and instruction follow the syllabus of the Lignite Education Seminar.

[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](#)

It is important for not just “teachers” to attend our Seminar, leadership in education and career counselors in the school play a vital role in the education and eventual career-hunt process. With

this in mind, the Lignite Energy Council sought out to recruit and increase attendance of school principals and career counselors through the offering of a STEM technology grant. This initiative began in 2019.

Each career counselor and/or principal/vice principal or equivalent to attend and complete the Seminar was entered to win a STEM Technology Grant for their school or district. That grant amount was \$1,000 and was awarded from the Lignite Energy Foundation. The 2019 recipient was Gloria Odden from Strasburg Public School, an elementary principal and counselor, who used the grant to implement LEGO Robotics at the school. (An award was not made in 2020 due to the Seminar being cancelled)

Lignite Learn (an E-Campus)

While 2020 presented many challenges due to the COVID-19 pandemic, 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 a two-pronged website aimed at laying the foundation for an e-learning option for the Lignite Education Seminar.

The multi-phased approach:

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.

Targeted Completion: October 31, 2020

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. Phase II will also aim to market interactive courses to teachers for use in their classrooms.

Targeted Completion: March 31, 2021

III. Live Virtual Teacher Seminar

Fully functioning and live version of the two-credit (24 – 30 instructional hours) Lignite Education Seminar. Will include virtual tour elements, live and in-studio presentations, and other interactive elements such as polls, quizzes and games.

STANDARDS OF SUCCESS

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

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
- 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 an 70% agreement that coal is vitally important to our region's power supply.
- Target audience will report more than an 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 the Lignite Learn E-Campus is 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 Seminars since 1986. The Seminar is reviewed by UND faculty member Terry Hagen, who oversees the Seminar as part of UND's School of Business and Public Administration. The coordination of the Seminar is handled by Kay LaCoe, the Director of Membership Marketing with the Lignite Energy Council. 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.

More than 3,400 teachers in more than 600 schools have completed the Seminar and it is estimated that more than 60,000 students receive some education about lignite and its role in the regional economy every year. More than 750 of these teachers are from out of state.

Recruitment

Each year, the Seminar's administrator works closely with recruitment representatives with each of the electric utilities that have customers in targeted states. The Lignite Energy Council provides these recruiters with printed and electronic promotional material. The recruiters are responsible for disseminating the information 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 or print and submit a completed form.

Recruitment in North Dakota consists of a printed direct-mail piece sent to every licensed teacher in the state. Additional recruitment methods used include a letter and several recruitment brochures sent to every school principal, targeted Facebook advertisements and advertisements in regional trade publications.

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 kindergarten through 12th grade teachers 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, development and marketing; education; and public relations. 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.

Kay LaCoe serves as the Director of Membership Marketing for the Lignite Energy Council. Kay has a Bachelor of Science Degree in Business Communications from the University of Mary. She worked extensively with the Seminar since 2008 prior to assuming the role of program administrator and project manager in 2014.

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's of science degree in chemical engineering from the University of North Dakota and a bachelor's 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.

MANAGEMENT

The Lignite Energy Council will manage and oversee the Seminar and its Board of Directors has authorized the program and budget. Kay LaCoe, Director of Membership Marketing, is the primary person responsible for the Seminar. Kay 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.

TIMETABLE

The Lignite Energy Council's Teacher Education Seminar described in this grant request runs from January 1, 2021, through December 31, 2022.

BUDGET

The Lignite Energy Council's Teacher Education Seminar annual budget, including in-kind services, from January 1, 2021, through December 31, 2022 is \$412,000.

The Education Program budget encompasses three key items – expenses for program and Seminar management, expenses for professional services and expenses to expand the outreach of the program.



Lignite Energy Council Education Program Budget

9/29/2020

Income				
	LRC Share	Applicant's Share	Applicant's In-Kind	
Program Management & Seminar Logistics	\$158,000	\$118,000	\$40,000	\$316,000
Professional Services	\$25,000	\$29,000		\$54,000
Program Materials	\$17,000	\$25,000		\$42,000
TOTAL	\$200,000	\$172,000	\$40,000	
TOTAL PROGRAM EXPENSES				\$412,000
Grant Request	\$200,000			
Lignite Energy Council	\$172,000			
Industry In-Kind	\$40,000			
TOTAL PROGRAM FUNDING				\$412,000
Expenses				
1 Program Management	<i>2 years</i>			
LEC Administrative Expenses (Labor & Equipment)	\$210,000			
Additional Staff Resources & Contingency (Labor)	\$4,400			
			\$214,400	
2 Teachers Education Seminar Logistics and Venue	<i>2 years</i>			
Recruitment (Materials & Services)	\$12,000			
Facility Rental (Fees)	\$25,200			
Meals	\$30,000			
Credits (Fees)	\$16,000			
Programming (Fees, Transp., Meals & Services)	\$18,400			
			\$101,600	
3 Professional Services (Labor)	<i>2 years</i>			
ND Energy Career Awareness Program	\$50,000			
Instructor of Record	\$4,000			
			\$54,000	
4 Program Materials, Supplies & Digital Assets	<i>2 years</i>			
			\$42,000	\$412,000

Some items within the budget that may require additional explanation are as follows:

- Program Management – 50% of the program director’s pay and benefits.
- Teachers Education Seminar Logistics and Venue – includes all meals, venue rental, recruitment efforts, speaker fees, transportation and 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. This also includes the annual fee for the instructor of record to accredit the Education Seminar.
- Program Materials, Supplies & Digital Assets – include all classroom materials available to teachers, website and e-campus development and maintenance and program expansion efforts.

MATCHING FUNDS

The Lignite Energy Council and its members will provide in-kind services and funding of at least \$200,000 for two years to match the Industrial Commission’s funding of \$200,000 for two years. Total funding requested for the two-year period is \$200,000, which will be matched by the Lignite Energy Council and its members.

TAX LIABILITY

I, Kay LaCoe, 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.

Kay LaCoe, Director of Membership Marketing
Lignite Energy Council