

◦ ◦ ◦ LIGNITE ENERGY COUNCIL ◦ ◦ ◦

◁ ANNUAL REPORT 2018 ▷

Leading through Advocacy and Innovation



Lignite
Energy Council

Letter to LEC Members

The Lignite Energy Council is now 44 years old. It was founded in 1974 to help the burgeoning mining industry in North Dakota keep up with state and federal regulations. The organization has expanded its scope and today is tasked not only with preserving the \$18 billion investment in lignite mines and coal conversion facilities but also looking at ways to grow the industry – often looking beyond the generation of electricity.

Strategies

The LEC Board of Directors has identified four strategic priorities that will help our industry unlock the future potential of North Dakota's 800-years of economically recoverable lignite reserves. The priorities are: emerging markets, resilience recognition, enabling legislation and increased funding for research and development. This report provides more information about each of these strategies.

Keys to a Brighter Future

A number of key events and accomplishments were achieved during the year that should provide value to our members not only this year but for the foreseeable future. Key among them was the release of the proposed Affordable Clean Energy rule in August, which holds the potential to repeal and replace the Clean Power Plan. The Lignite Energy Council submitted comments to the Environmental Protection Agency in October and urged our members to also submit comments in support of the new rule. The Council has been a fierce opponent of the Clean Power Plan, which had the potential to shut down half of the mines and power plants in the state.

Another key accomplishment was final release of a study by the Energy & Environmental Research Center (EERC) to identify "Value-Added Opportunities for North Dakota Lignite." These opportunities include rare earth elements and synthetic graphite.

In addition, a study on the regional economic impacts of CO₂ gas storage by the EERC and the North Dakota State University is in the final stages, and results were presented at the LEC's fall conference. The study emphasizes the economic value of the lignite industry and tremendous potential for incremental jobs, taxes and economic activity associated with enhanced oil recovery in western counties from captured CO₂ from lignite-based power plants.

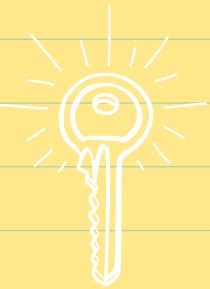
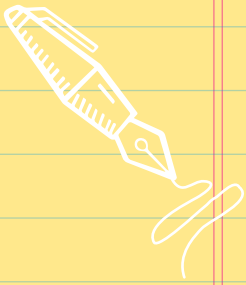
Major Programs

The Lignite Energy Council has four major programs – government relations, research and development, public affairs and education – through which we advance the goal of the lignite industry for the benefit of the mines, plants and contractor/supplier members.

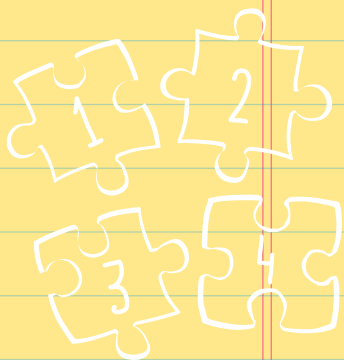
Each of the four program areas had significant accomplishments. In the public affairs arena, a public opinion poll taken in North Dakota last spring showed that 81 percent of the respondents favored or highly favored generating electricity from coal.

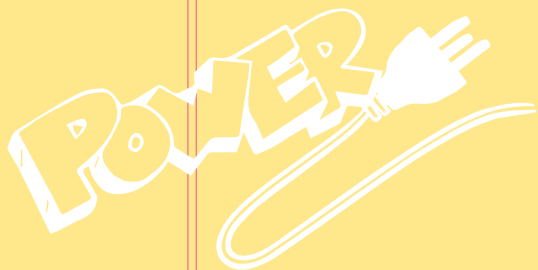
Given the onslaught of regulations during the preceding Presidential Administration, the rebound in support for coal-based electricity showed the value of a pro-active, advocacy effort for North Dakota lignite-based electricity through a series of TV advertising campaigns starting in 2017 and continuing into 2018. The theme for the advertising was "homegrown energy" and addressed the jobs, economic impact and tax revenues that strengthen North Dakota industry, businesses and homes.

EERC CarbonSAFE -
CO₂ Reduction Partnership

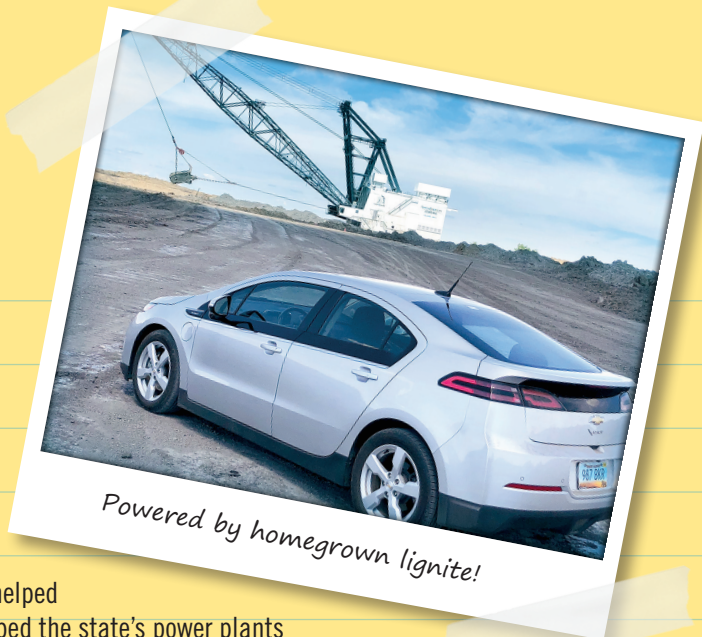


CO₂





The Lignite Energy Council worked to show policymakers how important electric vehicles can be to the future of the industry. These efforts included supporting infrastructure needs at a major new hospital in the Fargo area where people can plug in their cars. Also, a state-wide TV campaign featuring an engineer at a lignite mine and his electric car helped drive home the point that using electricity helped the state's power plants as approximately 70 percent of the state's power comes from "homegrown" lignite. The LEC also helped support and promote electric vehicle campaigns initiated by its members.



Powered by homegrown lignite!

Focusing on Education

The education program continues to center around the four-day teachers' seminar held every June at Bismarck State College. More than 100 teachers from North Dakota and surrounding states attend the seminar and learn how to take various aspects of the industry back into their classroom to help students learn about science, math and social skills. As we head into a new year, we are working on several projects to make lignite education more relevant and fun to students. These include traveling exhibits and updating educational videos.



Better Together

One of our key initiatives that we undertook in 2018 was increasing member involvement. The Council staff is only nine employees, but we represent much more — thousands of employees who work directly or indirectly in our industry. It's up to our members to determine how involved they want to be.

The contractor/supplier companies represent "Main Street Businesses" and your support of our industry is important politically as well as economically and socially. To that end, we began the monthly "Table Topics" this year to help give our members ideas about how they can engage with others about our industry.

To friends, family and even spouses, our members are the energy experts. That's why we encourage our members to stay engaged. Your continued investment in the Lignite Energy Council provides additional value to all of us when we work together as one. Thanks for attending our meetings, sporting events, liking and commenting on our social media and for your continued support.

We all benefit from affordable and reliable energy derived from North Dakota's bountiful lignite reserves. We want to stay positive and continue to build on the successes realized this past year.

Sincerely,

Jason Bohrer
President and CEO
Lignite Energy Council



Better Together...

Like all associations, members are the cornerstone that keep our work focused on providing value to the lignite industry and to our member companies. Most of our members are contractor/suppliers, which means their annual investment in the Lignite Energy Council can range from \$800 to \$10,400 annually. For that investment, companies received value in the millions of dollars.

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Monetary Return on Investment

The R&D program approved six projects during two grant rounds in 2018 that when completed will be worth a combined \$34.6 million. That's just this year. Including past years, the R&D program has provided more than \$700 million of value to the lignite industry, conservatively.

The public affairs program – **Coalition for a Secure Energy Future (CSEF)** – targeted \$1.2 million on improving the public's perception of coal-based electricity in the Upper Midwest. While the lion's share was spent in North Dakota media markets, grass roots efforts also occurred in Minnesota and other Midwestern states.

The education program spent more than \$200,000 in teaching educators about the role North Dakota lignite plays in their everyday lives and how career opportunities exist for young people who want to work at the power plants and surface mines, either directly or indirectly for the lignite industry.

Looking ahead

We want to continue building upon our relationships with our members. You and other employees of your company are the true ambassadors of the lignite industry and we will continue to work on your behalf to make our industry stronger and more resilient for the future.

R&D PROGRAM

6 projects approved in
2 grant rounds, worth

\$34.6 million



CSEF

\$1.2 million
invested in improving public
perception in Upper Midwest



EDUCATION

\$200,000
spent in teaching educators



Innovation...



LEC President and CEO Jason Bohrer provided updates on the board's strategic goals.



The board recently expanded to ensure voices of our contractor/supplier members were better represented.

Listening and Responding to Your Wants and Needs

The Lignite Energy Council also continues to meet our members' changing priorities. The industry isn't the same as it was 20 years ago and neither are our members. We need to change to meet their needs and we are doing just that.

We revamped our board of directors and committees to give our contractor/supplier members a greater voice in leadership.

A Membership Committee was created in 2018 to provide members at all investment levels an opportunity to be more involved in Lignite Energy Council major meetings, to develop improved services to members and serve in an advisory capacity for membership return on investment. The committee members represent various levels of membership and include representatives from the mines and power plants.

LEC Board of Directors 2018-2020

OFFICERS

Wade Boeshans	Chairman of the Board	BNI Coal, Ltd.
Paul Sukut	Past Chairman of the Board	Basin Electric Power Cooperative
Nicole Kivisto	Chairman Elect	Montana-Dakota Utilities Co.
Jason Bohrer	President & CEO	Lignite Energy Council
Brian Bjella	Secretary-Treasurer	Crowley Fleck PLLP
JC Butler	Management Committee	North American Coal Corporation

MAJOR PRODUCERS

Wade Boeshans	BNI Energy, Ltd.
Bryan Walther	The Coteau Properties Co.
Jay Kost	Falkirk
Brenden Brinkman	Coyote Creek Mining Company

MAJOR USERS

Al Rudeck	ALLETE/Minnesota Power
Paul Sukut	Basin Electric Power Cooperative
David Sauer	Dakota Gasification Company
Dave Saggau	Great River Energy
Nicole Kivisto	Montana-Dakota Utilities Co.
Mac McLennan	Minnkota Power Cooperative, Inc.
Tim Rogelstad	Otter Tail Power Company

RESEARCH

Kai Xia	Great Northern Properties, L.P.
Brian Davey	Brown Coal Innovation Australia

MAJOR RESERVE HOLDER & MAJOR SUPPLIER

Chris Friez	North American Coal Royalty
John Lee	Barr Engineering
Jeff Hammes	Industrial Contractors, Inc. (ICI)
Dan Butler	Butler Machinery

INVESTOR & SUSTAINING

Steven Sauter	Interstate PowerSystems
Mark Peterson	Bilfinger Westcon, Inc.

ASSOCIATES

Pam Link	Laborers District Council of MN & ND
Perrie Schafer	Environmental Services, Ltd.



The Lignite Energy Council shall protect, maintain and enhance development of our region's abundant lignite resource.

The primary objective of the Lignite Energy Council is to maintain a viable lignite coal industry and enhance development of the region's lignite coal resources for use in generating electricity, synthetic natural gas and valuable byproducts.

Members of the Lignite Energy Council include mining companies; major users that use lignite to generate electricity, synthetic natural gas and other valuable byproducts; and businesses that provide goods and services to the lignite industry.

The Lignite Energy Council Advocates for:

- More than 260 members
- Seven power plants
- One synthetic natural gas/fertilizer plant
- Five lignite mines that all support the lignite coal industry in North Dakota that provides low-cost energy and electricity to more than 2 million people.

At the Heart of Our Mission are Four Programs:

- 1. Government Action**
The LEC works with local, regional and national policymakers for passage of legislation favorable to the industry and works to mitigate or amend policies that would lead to increased taxes or singles out the lignite industry with stricter regulations.
- 2. Research and Development**
As regulations are implemented to reduce emissions from existing power plants and environmental rules are released for new generation facilities, R&D activities that lead to new technologies become increasingly important. Additionally, R&D projects seek to find new uses and applications for North Dakota's abundant reserves of lignite.
- 3. Public Relations and Marketing**
The goal of the LEC's PR and marketing program is to increase the public's knowledge and improve the perception of our region's lignite industry.
- 4. Education**
The LEC's education program offers annual seminars for teachers in the region where they are provided with the information and educational materials they need to teach their students about our region's lignite industry.

Government Action...



GOVERNANCE

Comments to EPA on Affordable Clean Energy Rule

On October 31, 2018, the Lignite Energy Council submitted comments to the U.S. Environmental Protection Agency in support of the proposed Affordable Clean Energy (ACE) Rule. ACE would replace the Obama-era Clean Power Plan with a rule that is within the guidelines of the Clean Air Act amendments. Simply put, the ACE rule looks to increase efficiencies at coal-based power plants rather than replace them with other generation sources. In addition to submitting its own comments, the LEC also encouraged its members to submit comments through the EPA portal so as to reduce the risk of EPA changing the ACE rule prior to it being finalized.

Increased Funding for Research and Development Projects

The North Dakota Legislature will consider a bill – **Operation Prairie Dog** – to increase spending for infrastructure throughout the state. The bill also seeks to triple the state's strategic investment fund for R&D that was received by the lignite industry in the last biennium. These added dollars can be used to leverage R&D dollars from the lignite industry, technology developers and the Department of Energy in developing cost-effective solutions to environmental and operational challenges.

Minnesota and North Dakota Legislative Tours

Taking legislators and legislative candidates on tours of the power plants and coal mines is one of the best ways to inform policymakers about issues facing the lignite industry. On June 7, we hosted a group of Minnesota legislators and legislative leaders following the completion of the 2018 Legislature. On September 20, we held a tour for North Dakota legislators and legislative candidates. In both cases, the tours included the Falkirk Mine and the Coal Creek Station. Legislators in both states learned why the lignite industry is such a huge benefit to the region's electric customers. They also saw first-hand how our industry ensures environmental stewardship.



EPA Hearing Session - Dec 4, 2018



Increased R&D Funds



North Dakota Legislative Tour

New Economic Study Shows Impact of Lignite Industry on North Dakota

The combination of in-state purchases of goods and services and employee payroll from firms involved in lignite-related activities generated a total business volume activity of \$5.7 billion in 2017, according to a new economic study completed by researchers at North Dakota State University. In 2017, estimated tax revenues were \$130 million from the lignite industry. The industry also employed 3,820 directly at the mines, generation plants and electricity firms in 2017. The mines and plants also support another 10,200 secondary jobs in the state such as those who work for contractors and suppliers, retail trade, wholesale trade, food and entertainment, personal service and banking.

Economic Facts & Impacts of North Dakota Lignite AT A GLANCE

\$18 billion

economic benefit resulting from investment by the lignite industry

5 lignite mines

7 power plants and the Great Plains Synfuels Plant



300

contractor/supplier companies



\$5.7 billion

total business volume through in-state purchases of goods and services



\$130 million

estimated tax revenue

3,820

direct employees



10,200

secondary jobs



\$113,000

average mining wages in Mercer County



\$109,000

average wages for electric production workers



1 of only **15**

states to meet all federal government ambient air standards

\$2 billion

invested in clean-coal technology



Supporting Enabling Legislation

As electric utilities make economic decisions regarding the future of coal-based electricity generation, legislation such as the 45Q tax credit for sequestered carbon dioxide becomes much more important. The 45Q tax credit garnered bi-partisan support and was part of the 2018 federal budget bill. Projects to retrofit existing power plants with carbon capture technology or to build new plants equipped with CO₂ capture technology can take advantage of this new credit if the CO₂ is safely stored in underground geological formations. If the CO₂ is also used for enhanced oil recovery, the seller of the CO₂ can sell the gas for EOR while also getting 45Q credits. In the future, the LEC will be promoting and supporting other tax credits to spur further advanced technologies to improve tomorrow's coal-based power plants.

Public Relations Activities...

✓ 81%

ND Poll Shows Public Support for Coal-based Electricity at 81%

A public opinion poll taken in North Dakota in the spring of 2018 showed an increase in the public's support of coal-based electricity. Support increased by four points from 77% in 2017. The pollster said that only Wyoming would score as high in a public opinion poll in support of coal-based electricity as the 81% support in North Dakota.

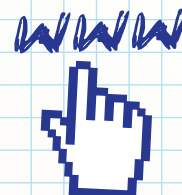


TV Campaigns Featuring "Homegrown Energy"

Some of the credit for the strong public support is due to three TV ads featuring Sarah Flath, the environmental manager at The Coteau Properties' Freedom Mine. The three ads ran prior to the survey – both on network TV and cable channels. One ad featured Sarah helping around the house, just as coal-based electricity helps power electric appliances. Two other ads featuring Sarah highlighted North Dakota's ag industry. One was shot at a dairy farm and the other at a meat processing plant, and both showed how electricity from coal helps add value to agricultural-based products in the state.

Since the survey was taken, another TV ad featuring a mining engineer from The Falkirk Mine, Steve Burke, has run on both network and cable TV. The ad featured Steve and his electric vehicle.

Another ad – featuring Steve Tomac and Mary Graner – was shot in August. The actors represent opposing political parties. The ad says that both Steve and Mary agree on the value of coal-based electricity. The ad has also run on network and cable channels.





Electric Vehicle (EV) Charging Station at Sanford in Fargo

In April, the Lignite Energy Council cooperated with Sanford in Fargo and Cass County Electric in placing charging stations for electric vehicles in the new hospital's parking lot. This charging station along with Steve Burke's ad are two ways that we have been supporting the growing electric vehicle market in North Dakota and messaging that North Dakota's all-of-the-above energy policy is keeping the vehicles charged affordably and reliably. In November, the West Fargo School District also announced the purchase of an all-electric school bus in 2019, which will be the first EV bus in North Dakota. The LEC is helping with the purchase through its marketing arm, the Coalition for a Secure Energy Future.

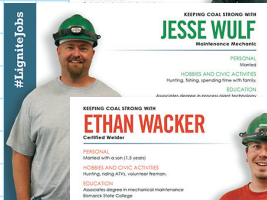
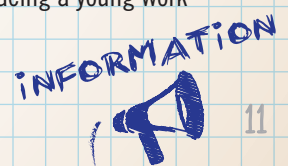
Employee Engagement

The Lignite Energy Council has also worked to engage more directly with members. There are several things we did toward that end. They included:

- Producing and disseminating the monthly "Table Topics" where we remind or inform our members about issues we would like them to discuss with family and friends.
- Inviting members to attend the Tomi Lahren presentation at the Annual Meeting. More than 200 employees of our members showed up to listen.
- Featuring eight employees at The Falkirk Mine and Coal Creek Station in a highly popular Labor Day campaign.
- Promoting a photo contest for the 2019 Lignite Energy Council calendar. Many of the entries are from employees at the mines and plants.

NextGEN ND

Beginning last winter, the Lignite Energy Council took the lead with the Petroleum Council and the North Dakota Farm Bureau in developing a 15-member youth advisory council, known as NextGEN ND. Over the summer, students in North Dakota schools applied to be on the council and 15 were chosen from across the state. The students are in 6th through 11th grades, and they will meet three times a year. Nine of the 15 toured the Center Mine and the Young Station in September. Their first meeting was held in October. They met again mid-December to discuss issues facing a young work force. The next meeting will be held in March.



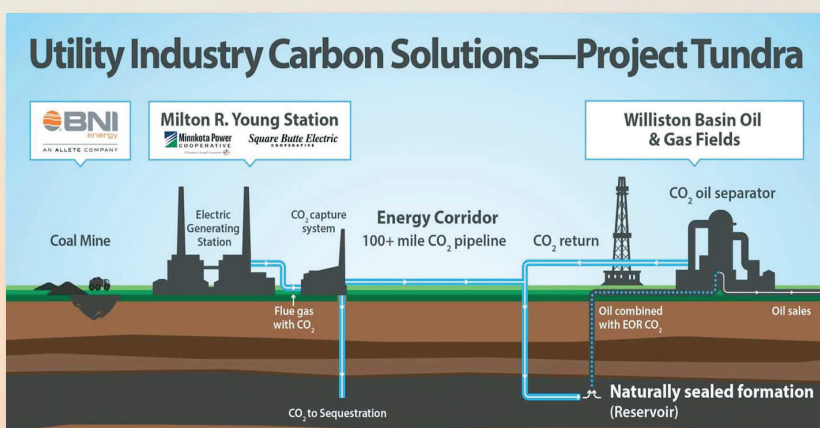
R&D Achievements...



R&D Funds for Project Tundra FEED Study

The North Dakota Industrial Commission (NDIC) approved \$15 million on November 20, 2018, to help fund a Front-End Engineering and Design (FEED) study for Project Tundra, a commercial-sized carbon dioxide (CO₂) capture system retrofitted on an existing lignite-based power plant. Modeled after the successful Petra Nova initiative in Texas, the vision for Project Tundra is to retrofit Unit 2 at the Milton R. Young Station with technology that could capture up to 95 percent of its CO₂ emissions. The CO₂ captured at the Young Station would be pipelined to western North Dakota for use in enhanced oil recovery projects. The total project cost is \$31 million and will generate a commercial model for consideration by other power plants in North Dakota.

Another \$15 million will be requested from the U.S. Department of Energy's National Energy Technology Laboratory in early 2019. Minnkota Power Cooperative,

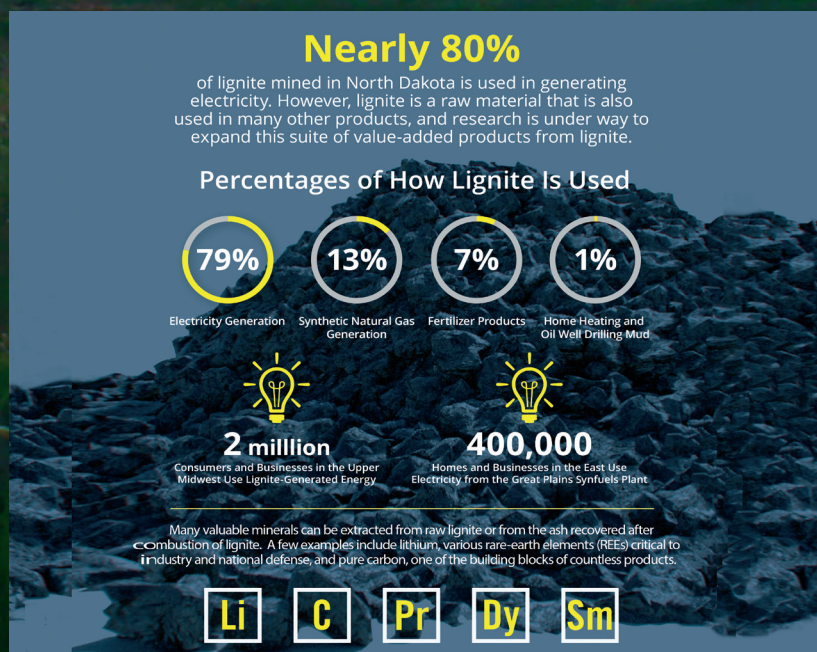


operator of Young 2, will also invest cash and in-kind contributions. Other participants include BNI Energy, Eagle Energy Partners, Mitsubishi Heavy Industries, Energy & Environmental Research Center, Burns & McDonnell and others.

The FEED study is expected to take up to 32 months to complete and will include not only equipment for the Young Station but also a design for an underground pipeline to transport the CO₂ 120 miles from the Young Station near Center, North Dakota, to oil fields near Watford City, North Dakota.

Value-added Uses of Lignite

The Energy & Environmental Research Center (EERC) completed a study titled "Investigation of Value-Added Opportunities for North Dakota Lignite". Two of the value-added products highlighted in the report are synthetic graphite, used increasingly for battery storage, and rare earth elements. The EERC's study compliments similar work that is being done in Australia by that country's coal industry. LEC Vice President of Research and Development, Mike Holmes presented on the wide range of uses for North Dakota lignite coal and listened to presentations on lignite uses in Australia during the first quarter of 2018. Brown Coal Innovation Australia and the Lignite Energy Council remain strategic partners on the enhanced uses of lignite. North Dakota is second only to Australia in known lignite reserves.



Monetizing CO₂ in North Dakota

A study titled “Regional Impacts of Carbon Capture and Sequestration Systems in the State of North Dakota” examined the value propositions of capturing CO₂ from coal-based power plants and using it for enhanced oil recovery.

Josh Stanislawski of the EERC presented key results at the LEC fall conference meeting on October 3, 2018. Over the next 30 years, CO₂ capture and utilization could provide \$45 billion in additional revenue to the state as the gas is used to produce otherwise stranded oil reserves in western North Dakota, Stanislawski noted.



Increasing the Value of CO₂ from an Existing Synfuels Plant

A white paper titled “Evaluation of DGC Rectisol Process for Production of Sweetened CO₂” was also completed this year by EERC. The study will help determine if CO₂ from the Great Plains Synfuels Plant can be cleaned up, creating more marketing options for this product. The report has been completed and is currently available.

This is a sampling of the suite of R&D projects that continue under the state's Lignite Research Program to enhance our existing units, evaluate future lignite uses and develop them for future commercial applications.



*Dakota Gasification Company –
Great Plains Synfuels Plant*

Links to Videos:

Steve Burke -

<http://bit.ly/LECElectricVehicle>

Jason Bohrer -

<http://bit.ly/LECSources>

Bi-partisan support for coal-based electricity -

<http://bit.ly/LECBiPartisan>

Maverick Thompson -

<http://bit.ly/LECCommunity>

Tyler Schafer -

<http://bit.ly/LEC2018Award>

2018 Reclamation Award -

<http://bit.ly/LEC2018Reclamation>



Lignite Education Program...



The objective of the Lignite Energy Council's Education Program is to educate teachers, students and members of the general public about career opportunities, economic benefits and operations of the lignite industry.



Teachers Seminar



The Lignite Energy Council hosted more than 100 educators, administrators and career counselors at the 33rd annual Lignite Education Seminar at the National Energy Center of Excellence on the Bismarck State College Campus in Bismarck, ND.

Each year, teachers from states in the Upper Midwest attend the four-day seminar to learn about how lignite is mined and used to produce energy for homes, farms and businesses. Participants are provided with information and educational materials as well as tour a lignite mine and power plant. In return, participants who complete the seminar and accompanying lesson plan receive two graduate level professional development credits from the University of North Dakota, North Dakota State University or Minot State University.

Coal Favorability and Educators



Participants are asked a series of public opinion questions prior to and following the conclusion of the Seminar to gauge their opinion of the coal industry including the use of the fuel, its importance to the region's power supply and whether it should be part of the energy future.

Consistently, feedback has demonstrated an increase in favorability and support of the use of coal due to information presented and awareness of the industry through participation in the Seminar

- 93.83% respondents said that they favor the use of coal to produce electricity – a 16.05% positive change.
- 77.92% strongly agreed that coal energy is vitally important to our region's power supply – a 20.78% positive change.
- 75% strongly disagreed that coal is a dirty form of energy and should not be part of our energy future – a 17.5% positive change.

Future Workforce



Attracting a future workforce is crucial as the industry faces a 50 percent retirement bubble in the next few years. Environmental technology improvements that are needed at existing plants and new construction projects in the future will increase the demand for a highly skilled workforce. Providing educators with an understanding of the lignite industry and related career opportunities provides them with the background knowledge to encourage students to consider the career opportunities in North Dakota's energy industry when they begin to look at career choices.

- 82% of past attendees have indicated that they have incorporated Seminar information into their teaching plans.
- 73.53% of past attendees say they have promoted the job opportunities in the lignite industry to their students.



North Dakota Energy Activities Trunks

As a result of the findings from an Education Advisory Group, the Lignite Energy Council collaborated with the State Historical Society of North Dakota to build North Dakota Energy Activities Trunk with Objects (NdEATO). We have produced 11 kits containing hands-on activities that are available for schools across the state to check out and use in the classroom through the North Dakota Regional Education Association's Centers.



Lignite Learn – an E-Campus

Lignite Learn is an online campus of seminar content adapted for at-home or in-classroom use. The multi-phase project will make content accessible and affordable to teachers who can't attend the seminar or past seminar attendees who want a refresher.

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. Through December 2018, the Lignite Energy Foundation has received \$7,440 in license plate sales. The Foundation receives \$15 per plate/per annual license renewal. This total includes income from the start of the funding in March 2017.



STEM Technology Grant

One more initiative launched in 2018 sought out to recruit and increase attendance of school principals and career counselors through the offering of a STEM technology grant. The \$1,000 grant was awarded from the Lignite Energy Foundation to a school/district of an attending principal/career counselor. The receiving school used the money to purchase LEGO Robotics kits for the school.



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