



April 1, 2013

Karlene Fine, Executive Director
North Dakota Industrial Commission
State Capitol
600 East Boulevard Ave Dept 405
Bismarck, ND 58505-0840

Dear Ms. Fine:

Attached please find application materials for review and consideration by the Industrial Commission and the Lignite Research Council. This application is submitted on behalf of the Energy Curriculum Project for funding support of \$75,000.

The Energy Curriculum Project is backed by a group of numerous stakeholders throughout the state that desire for our state's youth to have a grasp of the natural resources and robust energy industries North Dakota offers. Students are currently receiving limited North Dakota-specific energy curriculum. Our group proposes to insert a 2-week module of energy curriculum into the 4th and 8th grade North Dakota Studies courses.

North Dakota Studies is required by the state Department of Public Instruction and is a perfect avenue to provide valuable information in a fun and interactive way to create awareness of the wide spectrum of energy resources available in North Dakota.

Please find additional information on the Energy Curriculum Project among the following pages. If you have any questions, please contact me at emily.mckay@bismarckstate.edu and 701-224-2410.

Sincerely,

A handwritten signature in black ink that reads 'Emily McKay'.

Emily McKay

Enclosure

Energy Curriculum Project

**Applicant: Emily McKay, Bismarck State College
Energy Curriculum Project Manager**

On behalf of the education initiative stemming from
recommendations by EmPower North Dakota

Principal Investigator:

Emily McKay

Application Submitted:

Monday, April 1, 2013

Requested amount:

\$75,000

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ABSTRACT

Objective To develop relevant energy curriculum for 4th and 8th grade North Dakota Studies courses.

Expected Results 4th and 8th grade students, and their teachers, learn about energy through delivery of current curriculum.

Duration July 1, 2013 – September 30, 2014

Project Cost \$250,000 total plus in-kind contributions (project total includes \$75,000 request through Lignite Research Council grant application)

Participants EmPower North Dakota Commission members, representing North Dakota Petroleum Council, Lignite Energy Council, Great River Energy, Tesoro, Basin Electric Power Cooperative, Montana-Dakota Utilities Company, Xcel Energy, North Dakota Petroleum Marketers Association, North Dakota Ethanol Producers Association, North American Coal Corporation, North Dakota Department of Commerce, Next Era Energy, Otter Tail Power Company, Minnesota Power, Archer Daniels Midland, North Dakota Agriculture

PROJECT SUMMARY

The Energy Curriculum Project includes the development of energy curriculum in North Dakota Studies for students in 4th grade and 8th grade. Online modules will be developed with two weeks of content related to all of North Dakota's energy resources. Curriculum would be added to the North Dakota Studies courses as part of the state educational standards.

The project will provide the following benefits:

- Updated curriculum to include relevant information about North Dakota's robust energy resources in North Dakota Studies courses in 4th and 8th grade.
- North Dakota students and teachers have the opportunity to learn about energy through delivery of current curriculum, including the demonstration of relevancy to North Dakota.
- Teachers receive training on content and delivery of new curriculum and technology.
- Potential for mitigating the urgent workforce needs within the energy industry in North Dakota due to increased interest and understanding of energy industry and abundance of career options.
- Provides more educated citizens and contributors to North Dakota's future workforce.
- Supports Science, Technology, Engineering & Mathematics (STEM) emphasis.
- Potential for integration of energy curriculum into Valley City State University teacher education curriculum.

PROJECT DESCRIPTION

Two weeks of energy curriculum will be developed and delivered via online modules for North Dakota Studies courses in 4th and 8th grade. Major activities include:

- Secure funding - \$250,000 total cost (includes \$75,000 request through Lignite Research Council grant application) plus in-kind contributions of \$30,000 are procured to develop both 4th and 8th grade energy curriculum modules
- Select Project Team/Resources – Key leads are identified for each tier of project management structure. Commitments for involvement are confirmed with stakeholders.
- Identification of Content – Module topics and content are clearly outlined in cooperation with energy industry and available resources. Complementary resources available through industry are identified.
- Identification of Platform – A variety of platforms are researched, costs are assessed, and delivery platform is chosen (web-based, LMS, PDFs, etc.).
- Development of Curriculum – Teachers of 4th and 8th grade North Dakota Studies will gather in a workshop to participate in energy curriculum development. Their work is incorporated and compiled into a complete two-week module to be piloted.
- Pilot of Modules – Completed two-week module is piloted in Bismarck-area schools.
- Receive Teacher Input – Input from teachers of pilot module is received, organized and compiled for review and incorporation by project team.
- Update Content Based on Input – Input is reviewed and incorporated as needed into module.

- Train Teachers – Teacher training sessions are fully fleshed out with comprehensive agenda. Training sessions are held for 4th and 8th grade North Dakota Studies teachers on incorporating curriculum into existing North Dakota Studies programs, as well as using the online module and complementary experiments, hands-on materials, etc.
- Market/Outreach to Schools – Letters, brochures and website are created to provide detailed information on use of the energy curriculum, resources for more information, contact information, etc.
- Begin Using New Curriculum

Specific tasks will be outlined for each major activity to keep the project on track with assigned leads and deliverables. Bismarck State College will oversee the project and handle the areas of budget, schedule, records, and meeting coordination. Three project teams will lead the development of key parts of the project:

- **Delivery Platform Team**, led by Ray Hintz of Bismarck Public Schools Career Academy, will evaluate delivery, cost, compatibility and stakeholder buy-in.
- **Curriculum Team**, led by Matt Strinden of Department of Public Instruction, will evaluate materials, organize content, fit to delivery platform, and coordinate with educational standards.
- **Industry Team**, led by John Weeda of Great River Energy and Ron Ness of North Dakota Petroleum Council, will coordinate industry information for content and review proposed curriculum.

Project stakeholders are solicited for contribution based on their areas of expertise.

Resources will be coordinated between the project stakeholders, identified below:

N.D. Petroleum Council

Lignite Energy Council

Great River Energy

Tesoro

Basin Electric Power Cooperative

Montana-Dakota Utilities Company

Xcel Energy

N.D. Petroleum Marketers Association

N.D. Ethanol Producers Association

North American Coal Corporation

N.D. Department of Commerce

Next Era Energy

Otter Tail Power Company

Minnesota Power

Archer Daniels Midland

Department of Public Instruction

N.D. 4th and 8th grade teachers

Career & Technical Education

N.D. State Historical Society

Bismarck Public Schools – Career Academy

Bismarck State College

Valley City State University

Information Technology Council of N.D.

N.D. Agriculture – Terry Goerger

STANDARDS OF SUCCESS

North Dakota Studies is required curriculum for 4th and 8th grade classes in the state, however selection of specific unit content from the textbooks is optional based on available time constraints. The project will be considered a success if a quarter of the schools adopt the energy curriculum within the first year of being published and more schools added in each of the subsequent years. Work is underway with the North Dakota Department of Public Instruction to match the energy curriculum with the Common Core State Standards initiative, effective July 1, 2013.

BACKGROUND

The EmPower North Dakota Commission was established by the North Dakota Legislative Assembly to develop comprehensive energy policy for the state, and commissioners regularly heard that “workforce” was one of the top issues that energy companies, spanning all industries, were dealing with. Commissioners visited on ways to help individuals find jobs and held discussions with Job Service North Dakota, but it still didn’t address the problem that much of North Dakota’s youth leave the state to find jobs. The EmPower Commission wanted to find a way to keep young talent in the state and interested in energy careers.

EmPower North Dakota developed a subcommittee of commission members, including John Weeda (Great River Energy), Ron Ness (North Dakota Petroleum Council), Sandi Tabor (North Dakota Transmission Authority), David Straley (North American Coal Corporation) and a rotation of other commissioners, to address this problem. The subcommittee evaluated ways to reach North Dakota youth with valuable energy information and decided the best way to address workforce issues was to develop curriculum that would reach all North Dakota students. The North Dakota Studies program, which is a required course for all North Dakota schools, is a way to ensure that the message is delivered. The EmPower subcommittee identified stakeholders with Bismarck Public Schools – Career Academy, The North Dakota State Historical Society and Heritage Center, Department of Public Instruction and Distance Education. As the concept was presented, there was strong support to move forward.

The subcommittee also met with North Dakota Senator Larry Robinson, who is the executive director of University Advancement at Valley City State University (VCSU). VCSU is

one of the leaders in the state in teacher education, and VCSU has a strong interest in incorporating content within its teacher training courses to educate teachers on teaching their students about energy when they enter the workforce. The correlation between these efforts and the compatibility is strong, and VSCU hopes to support this education initiative at the higher education level at its school. The Information Technology Council of North Dakota is also interested in providing support for this educational initiative in which it will demonstrate the importance of technology in the energy sectors of North Dakota.

Both the Lignite Energy Council and the North Dakota Petroleum Council currently have an intensive three-day seminar that's held every summer for interested teachers. It's a robust program that includes energy curriculum on their respective industries, tours, special guest speakers, and experiments and materials that can be taken back to the classroom. Through this education initiative, the Lignite Energy Council and North Dakota Petroleum Council anticipate that their respective summer seminars can be modified to complement the material that will be incorporated in North Dakota Studies.

QUALIFICATIONS

Emily McKay, Bismarck State College (BSC), is serving as the project manager for the Energy Curriculum Project. Emily currently is the Director of the Great Plains Energy Corridor at BSC where she serves in a variety of capacities related to education, communications and event planning for the energy industry. She's also the Project Director of the TREND Consortium, a five-member North Dakota college consortium that is expanding and enhancing energy-related workforce training through a \$14.6 million Department of Labor grant. Prior to her work at BSC, Emily spent six years at Basin Electric Power Cooperative in the functions of electricity education, event planning, and corporate philanthropy.

Ray Hintz, Bismarck Public Schools Career Academy, is serving as the lead for the Delivery Platform Team. Ray is the Online Information Technology Instructor at the Career Academy and sits on the ITCND board of directors. Ray previously spent almost 20 years in the Watford City school system where he installed and administered internet service, wireless networks for the community and school and trained adults in information technology. Most recently Ray supervised the information technology department at the North Dakota Department of Career and Technical Education where he trained instructors and implemented information technology education programs in the state.

Erik Holland, State Historical Society of North Dakota, is part of the project team with curriculum development, as well as identifying ways to connect curriculum with hands-on lab opportunities with the Heritage Center. Erik is the Curator of Education and has developed programs for schools and the public and advocated the education voice for the Heritage

Center's \$7 million exhibit expansion and the new eighth grade North Dakota Studies curriculum. Erik has more than 35 years in education and interpretation at historic sites and museums in North Dakota, Wisconsin, Virginia and Minnesota.

Other project partners are: Neil Howe, Project Coordinator for the North Dakota Studies Project through the State Historical Society of North Dakota; Matt Strinden, Director of Teacher and School Effectiveness at the North Dakota Department of Public Instruction; Mike Gilbertson, administrator with Bismarck Public Schools; and Kent Ellis, Special Projects Coordinator of Bismarck Public Schools (North Dakota Energy Education and Career Awareness Program).

The Energy Curriculum Project will be using North Dakota teachers to assist in the development of the curriculum modules. These teachers will be spending time writing the curriculum, directing how to best integrate it into the classroom setting, type of delivery platform that best suits the information, as well as providing input on the pilot of modules and how to best modify the content. Teachers will be selected to participate based on knowledge and areas of expertise, and also will be representative of a cross-section of school size and location.

Also with the support of the EmPower Commission, the wealth of resources and experience of the organizations through which the commissioners are employed will provide much-needed in-kind support to help drive curriculum development and provide complementary learning materials for the two-week module.

VALUE TO NORTH DAKOTA

Students all around North Dakota will benefit from this additional curriculum by having the opportunity for more in-depth learning about North Dakota's robust energy industry: Lignite coal resources and coal generation; oil and gas geology and development; hydro, wind, and solar energy resources; geothermal prospects and pilot projects; biomass crops and biofuel production, etc.

North Dakota has so many exciting and varied energy topics that will really excite students and make them more aware of the natural resources and opportunities in their home state, as well as provide them with a better understanding of the industry to round out their education. Students will come away with an appreciation of how the energy sector impacts the state economically that provides a great number of stable, high-wage careers. This initiative supports Science, Technology, Engineering and Mathematics (STEM) emphasis, which provides for more educated citizens and contributors to our future workforce.

MANAGEMENT

Energy Curriculum Teams

Project Management
BSC NECE - Emily McKay
Budget, schedule, records, meeting coordination

Delivery Platform
Ray Hintz BPS Career Academy - Lead
Team Members:
Mike Gilbertson, BPS CA
Evaluate delivery, cost, compatibility, stakeholder buy-in

Curriculum
Matt Strinden Dept. Public Instruction - Lead
Team Members:
Neil Howe, ND Studies Project
Erik Holland, Curator of Edu., SHSND
North Dakota Teachers
Evaluate materials, organize content, fit to delivery platform, coordinate with educational standards

Industry Support
John Weeda EmPower ND - Lead
Team Members:
Ron Ness, ND Petroleum Council
Coordinate industry information for content and review proposed curriculum

TIMETABLE

Please see Exhibit A for Gantt Chart.

BUDGET

ENERGY CURRICULUM PROJECT

Proposed Budget

As of 3/26/13

Category	Description	Cost
Curriculum/Content	Identification and development of content and curriculum for 2 week module - 4th grade or 8th grade. Includes curriculum development teacher stipends & travel expenses \$20,800 (8 teachers, 6.5 days x \$400/day), N.D. Historical Society & content experts \$15,000. Update curriculum based on pilot feedback \$3,600 (3 teachers, 3 days x \$400/day) and materials \$600. Overall cost of \$40,000 per module.	\$40,000
Publishing	\$20,000 for each 2 week module	\$20,000
Teacher Training	Cost to train teachers and provide materials to teachers per module	\$25,000
Delivery Platform	Costs to deliver online modules/license fees per module (1000 students x \$25/student)	\$25,000
Project Management	Costs to manage project per module	\$10,000
Other	Additional costs to complete project - travel, supplies, marketing, misc. costs per module	\$5,000

TOTAL ONE MODULE | \$125,000

TOTAL COST - TWO MODULES (4TH & 8TH GRADE) | \$250,000

MATCHING FUNDS

The funding for the Energy Curriculum Project is as follows:

Total need of funds from the Lignite Industry	\$125,000
Grant request from the Lignite Research Council	\$75,000
Matching cash from member companies	\$50,000
Matching in-kind contributions	\$30,000
Total	\$125,000 cash \$30,000 in-kind

In-kind contributions detail:

Ethanol resource material	North Dakota Ethanol Council
Biodiesel resource material	Archer Daniels Midland
Wind resource materials	Xcel Energy, ALLETE
Electric generation resource material	Basin Electric Power Cooperative, Great River Energy, Minnkota Power Cooperative, Montana-Dakota Utilities, Otter Tail Power Company
Coal mining resource material	North American Coal Corporation, Westmoreland
Information Technology support and resource material	Information Technology Council of North Dakota
Curriculum and complementary support materials	Lignite Energy Council and North Dakota Petroleum Council
Curriculum and complementary support materials	Basin Electric Power Cooperative's Story Behind the Switch program
Media (photos, videos, simulations) for curriculum incorporation	All EmPower ND organizations

TAX LIABILITY

There are no outstanding tax liabilities owed to the state of North Dakota.

CONFIDENTIAL INFORMATION

Not applicable

Exhibit A: Energy Curriculum Project Gantt Chart

