



May 30, 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 Oil & Gas Research Council. This application is submitted on behalf of the Energy Curriculum Project for funding support of \$75,000.

The Energy Curriculum Project started as an initiative through the EmPower North Dakota Commission and its policy recommendation to “increase efforts to educate North Dakota’s youth, as early as grades 4-5, about North Dakota’s natural resources by developing curriculum to encourage interest in energy careers.” Students are currently receiving limited North Dakota-specific energy curriculum, and the state’s energy industry stakeholders are greatly supportive of this project. The Energy Curriculum Project’s goal is to develop 2-week modules of energy curriculum to be inserted 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

Oil and Gas Research Program

North Dakota

Industrial Commission

Application

Project Title: Energy Curriculum Project

Applicant: Bismarck State College

Principal Investigator: Emily McKay

Date of Application: Thursday, May 30, 2013

Amount of Request: \$75,000

Total Amount of Proposed Project: \$250,000

Duration of Project: 7/1/2013 – 09/30/2014

Point of Contact (POC): Emily McKay

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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

Total Project Cost: \$250,000 total plus in-kind contributions

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, North Dakota Ethanol Council, Bismarck State College, North Dakota Department of Public Instruction, Bismarck Public Schools

PROJECT DESCRIPTION

Objectives: The EmPower North Dakota Commission regularly heard from energy companies that “workforce” was one of the top issues spanning all industry sectors. Despite work with Job Service North Dakota and an energy career awareness program for high school students, there were still issues of North Dakota’s youth leaving the state to find jobs. To find a way to keep young talent in the state and interested in energy careers, an EmPower subcommittee was formed, 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. Conversations held with stakeholders ultimately led to the decision that energy education needed to happen early in a child’s school career, and students are currently receiving very little state-specific information. Since the North Dakota Studies curriculum is required for all North Dakota schools, and

using that vehicle was the way to ensure that the energy message is delivered. Energy curriculum will be created and inserted into the North Dakota Studies courses 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.

Methodology:

1. Secure funding
2. Select Project Team/Resources – Key leads identified for each tier of project management structure and commitments confirmed with stakeholders. Team will rely on experts in the field of education to drive development.
3. Identification of Content – Module topics and content are outlined in cooperation with energy industry and available resources. Industry resources and existing resources are available and known and will be incorporated as needed.
4. Identification of Platform – A variety of platforms are researched, costs are assessed, and delivery platform is chosen (web-based, LMS, PDFs, etc.) driven by teacher input.
5. Development of Curriculum – Teacher workshop held and writers identified to start curriculum development. Variety of teachers chosen based on the grade levels, geographic location and school size to ensure a cross-section of schools throughout the state.
6. Pilot of Modules – Completed two-week module is piloted in Bismarck-area schools.
7. Receive Teacher Input – Pilot input is received and organized for review.
8. Update Content Based on Input – Input is reviewed and incorporated as needed into module.
9. Train Teachers – Training sessions are fully fleshed out with comprehensive agenda for fully incorporating curriculum, using online module and resource materials.
10. Market/Outreach to Schools – Letters, brochures and website provide detailed information on use of the energy curriculum, resources for more information, contact information, etc.

11. Begin Using New Curriculum

Three project teams will lead the development of key parts of the project: **Delivery Platform**, 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. Additional team members are solicited for contribution based on their areas of expertise.

Anticipated Results: The updated curriculum will have relevant information about North Dakota's robust energy resources in North Dakota Studies courses in 4th and 8th grade. Students and teachers will have the opportunity to learn about energy and its relevancy to North Dakota. Teachers will be trained on content and delivery of new curriculum and technology. Urgent workforce needs are potentially mitigated due to increased interest and understanding of energy industry and abundance of career options. Citizens are more educated and contributors to North Dakota's future workforce. Science, Technology, Engineering & Mathematics (STEM) concepts are supported. Energy curriculum could potentially be integrated into Valley City State University teacher education curriculum and other interested institutes of higher learning.

Facilities: Not applicable

Resources: The Energy Curriculum Project will be using North Dakota teachers to develop 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.

There is a great deal of available literature and an abundance of resources available on energy curriculum. Some of the leading demonstrations on comprehensive energy education are:

[National Energy Education Development Project \(NEED\)](#)

[Houston Museum of Natural Science](#)

[U.S. Department of Energy – Energy Education & Workforce Development](#)

There are resources available through the teachers' seminars conducted by the Lignite Energy Council and the North Dakota Petroleum Council as well. The curriculum writers will be aware of this information for it to be incorporated as appropriate.

Techniques to Be Used, Their Availability and Capability: Not applicable

Environmental and Economic Impacts while Project is Underway: Not applicable

Ultimate Technological and Economic Impacts: Not applicable

Why the Project is Needed: This project addresses industry concerns that there be a pipeline of future employees available for energy careers, especially when considering the increased and sustained development of the oil- and gas-related industry.

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 curriculum will be developed to incorporate Common Core State Standards (to be implemented July 1, 2013) and incorporate a variety of information, activities, and hands-on options, to entice teachers to

choose the energy unit not only because of the variety, but because of the high interest and the great impact that energy has on our state.

The nature of this project provides for difficulties in specific, measurable goals since the program is a long-term program starting in the 4th grade. Measuring that differential is influenced by many factors, so it is hard to attribute specific success to this effort. Previous efforts have been geared toward high school level, and the EmPower Commission feel that it's important to raise the level of interest at a younger age, encourage their involvement in STEM curriculum as they go through their school careers, and be open to a high-wage, stable energy career as they graduate. The industry sees this overall effort as complementary to other work that is being done by education and industry.

Because the new curriculum will be web-based, tracking usage through page hits will help project management gauge usage of the curriculum over time. 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.

BACKGROUND/QUALIFICATIONS

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. These education initiatives have laid the groundwork for the energy curriculum project and establishing a one-stop-shop for all energy sector material for teachers. 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.

The principal investigator, Emily McKay, has a background that provides for a broad range of expertise in many concepts surrounding this project. McKay was a teacher for two years in the United

States Peace Corps and during that time taught high school students, wrote curriculum and lesson plans, lead pedagogy seminars for teachers, and was co-lead for a country-wide English study camp for 120 students. After her Peace Corps service, McKay joined Basin Electric Power Cooperative as demonstration coordinator where she created an hour-long lesson delivered to grades K-12, in addition to community groups and visiting tour groups. The lessons focused on how electricity works, electrical safety, lignite mining, coal-based power, wind generation, transmission and more. Over McKay's three years as a traveling teacher, she presented to more than 3,000 students in a nine-state service territory. McKay has a background in education and experience in industrial educational work to leverage her abilities with a broad range of expertise available from both the educational and the technical worlds to provide a comprehensive approach to project management and support. Emily is the Director of the Great Plains Energy Corridor at Bismarck State College 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.

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.

Neil Howe, Project Coordinator for the North Dakota Studies Project at the State Historical Society of North Dakota, is also part of the curriculum development team. Neil has been involved in education as a classroom teacher and school administrator for more than 30 years. Between 1974 and 1980, Neil was a social studies teacher in the Leonard School system, in rural Cass County. In 1980, Neil began working at the ND Center for Distance Education as teacher and principal at the Center. In 1999, he became director of the Center and served in that role until he retired in 2005. In 2005, the ND Legislative Assembly authorized and provided funding to develop North Dakota Studies materials for both Grades 4 and 8. In July 2011, North Dakota Studies was transferred to the State Historical Society of North Dakota where Neil remains project coordinator. Since 2005, Neil has coordinated the development and publication of 13 North Dakota Studies print and online documents for grades 4, 8, and high school. These include the 4th grade series, the *Habitats of North Dakota* series for grade 4, *North Dakota Legendary* for grade 8, *North Dakota History* for high school students, and *Governing North Dakota 2011-2013*.

Other project partners are: 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).

MANAGEMENT

As project manager, Emily McKay will coordinate all the activities of the project teams, schedule timely meetings to ensure objectives are being met during course of the project, and ensure that target timelines are reached and budget is on track. Emily will monitor the project management spreadsheet

with outlines major activities, deadlines, individual tasks and targets. Regular communications will happen between project management, stakeholders, and project participants. The EmPower Commission will receive regular updates from project management, in addition to any reports required for funding sources.

Project Management	Emily McKay – BSC
Budget, schedule, records, meeting coordination	

Delivery Platform Ray Hintz BPS Career Academy		Curriculum Team Matt Strinden Dept. Public Instruction		Industry Support Ron Ness EmPower ND	
Evaluate delivery, cost, compatibility, stakeholder buy-in	Team Members: Mike Gilbertson, BPS CA	Evaluate materials, organize content, fit to delivery platform, coordinate with educational standards	Team Members: Neil Howe, ND Studies Project Erik Holland, Curator of Edu., SHSND North Dakota Teachers	Coordinate industry information for content and review proposed curriculum	Team Members: Mike Jones, Lignite Research Council John Weeda Great River Energy

TIMETABLE

See Exhibit A

BUDGET

The Energy Curriculum Project is seeking a total of \$250,000 in funding, as outlined in the proposed budget below, to develop both a 4th and 8th grade curriculum. If less funding is received, either the 4th or 8th grade module would have to be deleted. This would hamper the goals of the project as this is designed to be a progressive process of familiarizing students with North Dakota energy as they progress through their education and inspire them toward higher education that prepares them for jobs in North Dakota. The project team is committed to providing an excellent curriculum that teachers will choose to implement in the classroom, and we want to provide the best resources and support we can.

ENERGY CURRICULUM PROJECT		
Proposed Budget		
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

The combination of funding for the Energy Curriculum Project is as follows:

Total need of funds	\$250,000
Grant request from the Lignite Research Council	\$75,000
Matching cash from Lignite companies	\$50,000
Grant request from the Oil & Gas Research Council	\$75,000
Matching cash from the North Dakota Petroleum Council	\$50,000
Matching in-kind contributions from Petroleum companies	\$25,000
Total	\$250,000 cash
	\$25,000 in-kind

In-kind contributions will come from stakeholder companies in the form of information, resources, maps, and media (photos, videos) to incorporate with online learning modules.

CONFIDENTIAL INFORMATION

Not applicable

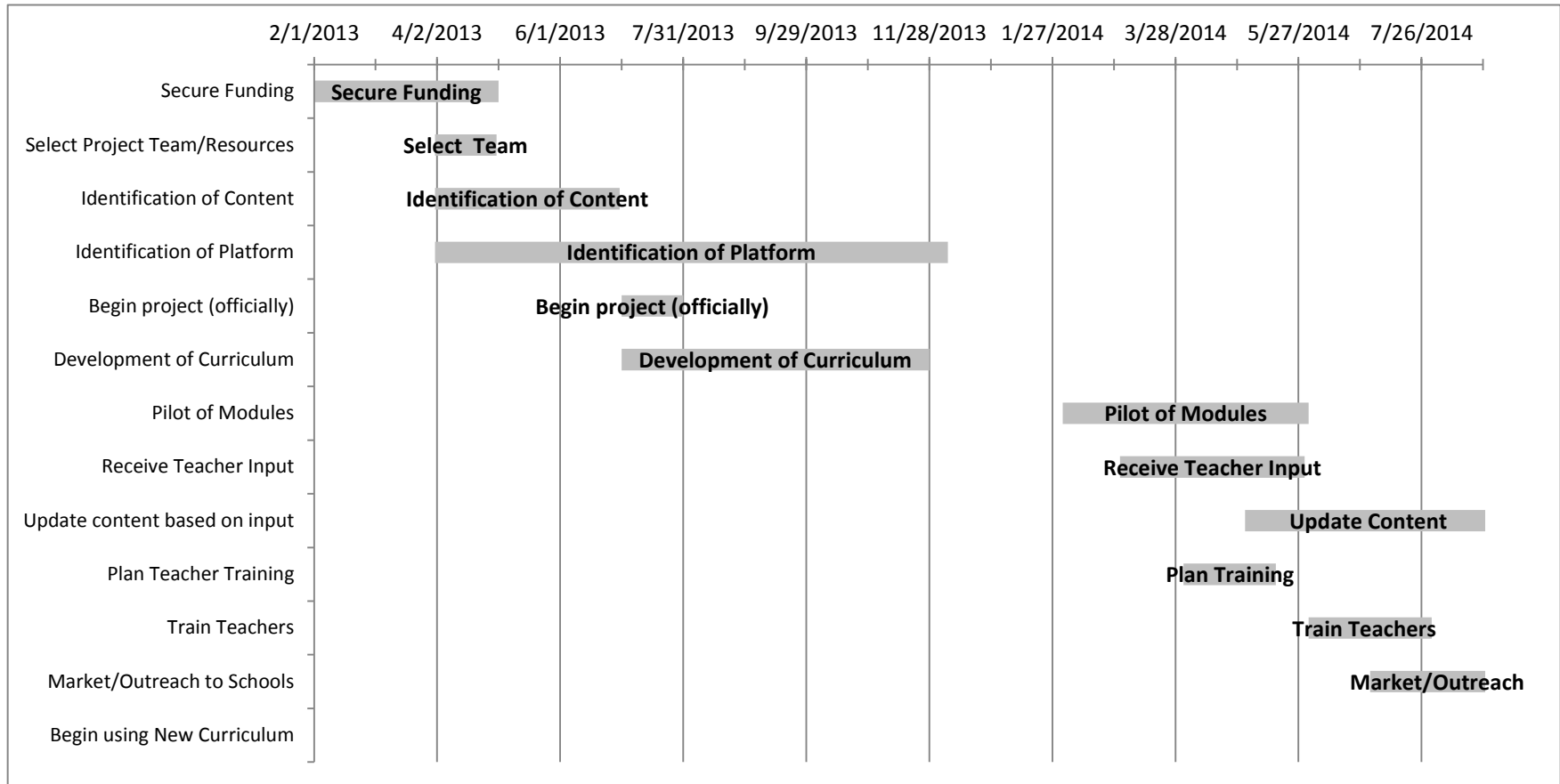
PATENTS/RIGHTS TO TECHNICAL DATA

Not applicable

STATUS OF ONGOING PROJECTS (IF ANY)

Not applicable

TIMETABLE



Project updates will be made to the EmPower Commission three times a year. Interim reports will be provided as needed to funding sources.