# Renewable Energy Program

North Dakota's Renewable Energy Program (REP) was established by the Legislature in 2007. The law provides that the Industrial Commission shall consult with the Renewable Energy Council (REC). The REC is made up of 7 individuals including the Commerce Commissioner, who serves as chairman, and representatives from the following 6 industries: agriculture, biomass, biodiesel, wind, ethanol and sugar beet based ethanol. The Department of Commerce provides technical assistance on the management of this program.

The mission of the Renewable Energy Council (REC) is to promote the growth of North Dakota's renewable energy industries through research, development, marketing, and education.

## Blue Flint Ethanol E85 Blending Facility

*Blue Flint Ethanol, LLC (BFE)*

BFE installed facilities that allow for in-line blending of E85. BFE is marketing E85 to retail fuel stations in the state. It is believed that consistent availability of an E85 product that is blended into the truck as opposed to splash or tank blended will grow retail market use of this product. The grant award of $50,000 consisted of approximately 43% of the total cost of the project.

## Feasibility Study of a Biomass Supply for the Spiritwood Industrial Park

*Great River Energy (GRE) along with: Great Plains Institute, North Dakota Association of Rural Electric Cooperatives, North Dakota Department of Agriculture, North Dakota Farmers Union, North Dakota Natural Resources Trust.*

This project performed a technical evaluation of the prospects for integrating a biomass supply into Spiritwood Station. The grant award of $109,000 consisted of approximately 23% of the project cost.

## ComPAKer

*ComPAKco, LLC*

This project will develop a mechanical device which will increase the density of biomass in order to transport and utilize it efficiently. The unique design and use of supplemental binder material in the proposed ComPAKer will result in less power requirements and a lower cost than pellet making machines currently available. The produced biomass "PAK" is uniform in size and shape and can be handled and transported much more efficiently than the raw biomass and further will allow the "PAK" to be easily integrated into both conventional combustion and biomass gasification systems. The grant award of $72,275 consisted of 50% of the total project cost.

## Small Wind Turbine Training Center

*Energy & Environmental Research Center (EERC)*

The small wind turbine training center will consist of two small wind turbines less than 20 kW in size. The facility will provide educational opportunities to a wide range of participants including grade school through college-level students and the general public. The facility will allow the EERC to provide technical training workshops related to the installation, operation, and maintenance of small wind turbines. The grant award of $50,000 consisted of 50% of the total project cost.

## Renewable Electrolytic Nitrogen Fertilizer Production

*Energy & Environmental Research Center (EERC)*

This project optimized a process for producing nitrogen fertilizers using biomass gasification-derived synthesis gas (biosyngas), nitrogen extracted from air and electricity as a prerequisite for commercialization. Commercialization of the processe would enable regionally produced fertilizer to compete economically with imports and simultaneously develop a new fertilizer production industry. The grant award of $200,000 consisted of approximately 49% of the total project cost.

## Abundant Energy: A Proposal for Wind Power Development & Technical Education

*Lake Region State College*

This project will site and erect an operating 1.65 MW wind turbine and design and implement a wind turbine training technician program. Lake Region proposes to utilize the wind turbine to provide most of the electricity required by the campus. The grant award of $500,000 consisted of approximately 12% of the total project cost.

## Ethanol Fuels Promotion

*American Lung Association of ND & ND Ethanol Producers Association*

This project will implement an education and promotion campaign to build ND consumer awareness of the benefits of ethanol and move consumers to increase ethanol usage. The grant award of $30,000 was approximately 41% of the total project cost.

## Fischer-Tropsch (FT) Fuels Development

*Energy & Environmental Research Center (EERC)*

This project prepared pilot-scale testing equipment and performed testing in the areas of FT liquid production, catalyst development, catalyst testing, product upgrade, and process simulation. Biomass-derived syngases were used for testing. The development of FT technologies to produce liquid transportation fuels from biomass, waste and coal will provide a new industry for North Dakota. The grant award of $189,034 consisted of approximately 21% of the total project cost.

## Developing a Biomaterials Industry in ND

*North Agricultural Experiment Station, North Dakota State University*

This project completed a front end engineering and design (FEED) study for a pilot scale plant to demonstrate the commercial potential of technology to produce materials and fuel from biomass feedstock. produce bio-based cellulose nanowhiskers. The grant award of $800,000 consisted of approximately 45% of the total cost of the project.

## Corn Oil Extraction

*Headwaters Inc., & Great River Energy*

Equipment to extract corn oil, a product not currently harnessed in ND, was set up at Blue Flint Ethanol. The oil provides another revenue source for ethanol plants. A grant award of $500,000 consisted of 25% of the total project cost.

## Renewable Oil Refinery

*Energy & Environmental Research Center (EERC)*

This project will provide a complete, ready-for-bid design of a pilot-scale renewable oil refinery capable of producing diesel fuel, jet fuel, and naptha. By utilizing crambe, it can provide a sustainable market for crops suited for areas of North Dakota with a shorter growing season, arid conditions, and suboptimal soil. The grant award of $500,000 consisted of 50% of the total project cost.

## Biomass Enhanced Refined Lignite Demonstration

*ComPAKco*

This project optimized the design and operation of the ComPAKer to blend lignite with biomass in "PAKs". The targeted market for PAKs is rural institutions and homes. A grant award of $275,000 consisted of 45% of the total project cost.

## Renewable Electrolytic Ammonia Production from Water and Nitrogen

*Energy & Environmental Research Center (EERC)*

EERC will develop and demonstrate a one-step electrolytic process for renewable ammonia production that utilizes inputs of water, air-separated nitrogen, and wind-generated electricity. A grant award of $250,000 consisted of 42% of the total project cost.

## Evaluation of ND Perennial Herbaceous Biomass Crops

*ND Natural Resources Trust*

Phase II of a 10 year study, the project will contribute to long-term data that will ultimately determine the most productive grass species, optimal harvest methods, and best practices to maintain productive perennial biomass stands in ND. A grant award of $280,000 consisted of 67% of the total project cost.

## Dakota Turbines

*Posilock Puller, LLC*

This project will create the most reliable, cost-effective and efficient small wind turbine on the market and is scalable from 5 - 100 kW. A grant award of $178,500 provided 36% of the total project cost.

## Bulk Energy Storage for ND Wind Energy

*Dakota Salts, LLC*

The goal of this project is to utilize compressed air energy storage (CAES) to store wind energy in ND. If successful, CAES will provide a way to harness and utilize wind energy in a more consistent manner thereby reducing transmission requirements. A grant award of $225,000 provided 39% of the total project cost.

## Energy Beet Research

*Green Vision Group*

This project aims to advance the creation of an energy beet biofuel industry in five regional locations across North Dakota. Tasks include burn tests, yield trials, processing research, and education. A grant award of $165,000 provided 50% of the total project cost.

## Biomass Testing Laboratory

*North Dakota State University*

A Biomass Testing Laboratory will be established to evaluate physical and thermal characteristics of diverse ND feedstock and the densified biomass products. The lab is a joint venture between NDSU and USDA-ARS in Mandan. An award of $225,000 will provide 40% of the project cost.

Great River Energy (GRE)

## Dakota Spirit AgEnergy Cellulosic Biorefinery

Funds will help pay for the development phase of a cellulosic biorefinery, including a Pre-FEED study and financial model. The biorefinery will be located adjacent to GRE's Spiritwood Station, a combined heat and power (CHP) facility under construction near Spiritwood, ND. Utilizing proven Danish technology, the biorefinery will convert wheat straw and/or corn stover to higher value energy products such as cellulosic ethanol, C5 molasses and purified lignin pellets. The REP provided $500,000, 40% of the total project costs.

## Promoting Standardization of Combustion Characteristics for Biofuels

*Energy & Environmental Research Center (EERC)*

Standardized methods to test the chemical and combustion characteristics of biomass feedstocks will be established. Standards that establish the quality of materials will help advance the biomass industry in North Dakota. The REP provided $50,000, 45% of the total project costs.

## Developing a Biomaterials Industry in ND

*North Dakota State University*

Funds for this project will be used to demonstrate a new pretreatment process for densifying biomass. The pretreated biomass could feed an integrated biorefinery that would produce fuels, chemicals, and composites. The REP provided $406,120, 50% of the total project costs.

## Biobased Hybrid Resins for Pultrusion Composites

*North Dakota State University*

Funds for this project will be used to develop bio-based composites. If successful, the composites would be manufactured in Fargo at the Tecton facilities. The main source of feedstock for this project will be ND vegetable oils. An award of $200,000 will provide 50% of the project cost.

**For More Information**

Call the Industrial Commission at 701-328-3722 or visit us on the web:

www.nd.gov/ndic/renew-infopage.htm.

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## North Dakota Industrial Commission

Competitive Grants Program