University of Nebraska Lincoln | NEBRASKA CENTER FOR ENERGY SCIENCES RESEARCH

2008/09 Energy Research Grants

NCESR. The Nebraska Center for Energy Sciences Research (NCESR), a collaboration between the Nebraska Public Power District (NPPD) and the University of Nebraska-Lincoln (UNL), was established in April 2006 to conduct research on renewable energy sources, energy efficiency and energy conservation; and to expand economic opportunities and improve quality of life for Nebraska and the nation.

Goal. The overall goal of the NCESR is to foster research and education in energy sciences by providing funding to support innovative research and collaboration among University of Nebraska-Lincoln faculty and other public- and private-sector organizations and businesses working in energy sciences.

RFP. The NCESR released the Request for Proposals (RFP) for its third competitive round of Energy Research Grants on June 20, 2008. The focus areas included:

1. *Identification, technical assessment and feasibility of cost-effective options for reducing greenhouse gas emissions from power generation by Nebraska's public power districts.*
2. *Theoretical and applied research on validating opportunities to offset greenhouse gas emissions in Nebraska, especially from the agricultural and biofuel industries.*
3. *Options for storage of off-peak energy from power plants and wind turbines and reducing the cost of distributed power generation in rural areas.*
4. *Basic and applied (pilot-scale) research on bioenergy or biofuel production from cellulosic biomass or other biomass resources (e.g. algal systems, wood, municipal waste, livestock manure, etc.) via biological or thermo-chemical conversion.*
5. *Research on improving the efficiency of catalysts and enzymes for converting biomass-derived carbon molecules to biofuels and/or other high value bio-based products.*

Selections. Sixteen faculty teams submitted proposals requesting more than $1.75 million. The External Advisory Committee (EAC) met on September 19, 2008 and awarded $390,878 for the following new energy research projects:

- *Reducing Greenhouse Gas Emissions from Ethanol with Byproduct Feeding*
  - Galen Erickson, Animal Science
- *Western Nebraska Perennial Grass Production Under Variable Water for Ethanol Production*
  - Gary Hergert, Panhandle Research and Extension Center
- *Opportunities for Nebraska in Future Carbon Markets*
  - Richard Perrin, Agricultural Economics
- *Modeling and Simulation of the Effects of Dispersed and Distributed Generation Dynamics on Electric Distribution Networks*
  - Sohrab Asgarpoor, Electrical Engineering
- *A Route to Store Off-peak Energy: New Hydrogen Storage Materials and Synthetic Strategy to Optimize Hydrogen Adsorption*
  - Wonyoung Choe, Chemistry
- *Carbon-negative Biofuels from Gasification and Pyrolysis of Biomass*
  - David Jones, Biological Systems Engineering
- *Generation of Bioenergy from Solid Agricultural Wastes with Novel Microbial Fuel Cell Technology*
  - Tian C. Zhang, Civil Engineering
- *Establishing the Synthetic Potential of Geothermal Dehydrogenases*
  - David Berkowitz, Chemistry
- *High Efficiency Acetylation of Biomass and Co-Products of Ethanol Production for Value-Added Bioproducts*
  - Yiqi Yang; Textiles, Clothing and Design

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103 Alexander Building - West / 312 N 14th Street / P. O. Box 880447 / Lincoln, NE 68588-0447
(402) 472-6743 / FAX (402) 472-9323 / http://ncesr.unl.edu