

2011/12 Energy Research Grants – Cycle 6

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.

Request for Proposals. The NCESR released the Request for Proposals (RFP) on for its sixth competitive round of Energy Research Grants on June 1, 2011.

Selections. The External Advisory Committee (EAC) met on December 14, 2011 and selected seven energy research projects to fund from among the 24 proposals submitted by UNL faculty teams. The projects funded, by focus area, are as follows:

1. Energy conversion, including but not limited to, hydrogen, ethanol or other intermediate fuel sources.
 - *Highly Efficient and Durable Catalysts for Fuel Cell Applications* – Jian Zhang, Chemistry
 - *Enhanced Hydrogen Electrolysis and Heat Transfer Using Micro/Nano Structured Surfaces* – Dennis Alexander, Electrical Engineering
 - *High-Performance Organic Solar Cells* – Stephen Ducharme, Physics and Astronomy

2. Development of any other highly creative and innovative energy research, in an area not specifically described in the other 2011 Focus Areas.
 - *Intelligent Demand Prediction and Operation Optimization for Cost-effective Campus Cooling* – Jeonghan Ko, Industrial and Management Systems Engineering
 - *Carbon Nanotube Coating on Copper Transmission Coils for Wireless Vehicle Charging* – Yongfeng Lu, Electrical Engineering

3. New approaches to capture carbon dioxide (CO₂).
 - *Color Indicated Rapid Carbon Capture in Metal-Organic Frameworks* – Li Tan, Mechanical and Materials Engineering

4. Energy storage, especially considering Nebraska's natural advantages and the critical role of energy storage in the full integration of renewable energy resources in utility portfolios.
 - *Evaluation of Energy Storage Strategies for Integration of Renewables into the Grid* – Sohrab Asgarpour, Electrical Engineering

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