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.

More background information

The 2006/07 Energy Research Grants selected include (in no particular order):

**Category 1a: Bioenergy Conversion Processes -- genomics, biochemistry, catalytic chemistry**

1. *Ethanol as an Energy Source and Terminal Reductant: Exploitation of Thermophilic Redox Enzymes in Catalyst Development and Screening*  
   Principal Investigator: David Berkowitz, Chemistry  
   Co-Investigator(s): Paul Blum, School of Biological Sciences

   [Slides](#)  
   [Abstract](#)

**Category 1b: Bioenergy Conversion Processes -- chemical and industrial engineering**

2. *Improving Ethanol Production Efficiency: Optimization of Corn-based Feedstock Energy Conversions*  
   Principal Investigator: David Jackson, Food Science & Technology  
   Co-Investigator(s): Wajira S. Ratnayake, Food Science & Technology, Rolando A. Flores, Food Science & Technology, Galen Erickson, Animal Science

   [Slides](#)  
   [Abstract](#)

3. *Ethanol: Utilization of By-Products*  
   Principal Investigator: Hossein Noureddini, Chemistry & Biomolecular Engineering

   [Slides](#)  
   [Abstract](#)

   Principal Investigator: Lijun Wang, Biological Systems Engineering  
   Co-Investigator(s): Milford A. Hanna, Biological Systems Engineering, Curtis L. Weller, Biological Systems Engineering, David D. Jones, Biological Systems Engineering

   [Abstract](#)

**Category 2: Physics; electrical, mechanical engineering**

   Principal Investigator: Dean J. Patterson, Electrical Engineering - visiting professor  
   Co-Investigator(s): Jerry L. Hudgins, Electrical Engineering

   [Slides](#)
6. **Rapid Screening Micro Fuel Cells for Portable Electronics**  
   Principal Investigator: Li Tan, Engineering Mechanics  
   Co-Investigator(s): Zhaoyan Zhang, Mechanical Engineering

7. **Magnetic Nanostructures for Energy-Efficient Cooling**  
   Principal Investigator: Christian Binek, Physics & Astronomy  
   Co-Investigator(s): Ralph Skomski, Nebraska Center for Materials & Nanoscience, David J. Sellmyer, Physics & Astronomy

8. **Flow Measurement of Power Plant Water Resources and Discharges Using Thermal Imaging**  
   Principal Investigator: David M. Admiraal, Civil Engineering  
   Co-Investigator(s): John Stansbury, Civil Engineering - Omaha, David Rundquist, School of Natural Resources, Dennis Alexander, Electrical Engineering, Junke Guo, Civil Engineering - Omaha

9. **Hydrogen Production and Storage Using Wind and Nuclear Sources**  
   Principal Investigator: Jerry L. Hudgins, Electrical Engineering  
   Co-Investigator(s): Sohrab Asgarpoo, Electrical Engineering, Dean Patterson, Electrical Engineering

**Category 3: Architecture; architectural engineering**

    Principal Investigator: Haorong Li, Architectural Engineering - Omaha  
    Co-Investigator(s): Song Ci, Computer & Electronics Engineering - Omaha, Hamid Sharif, Computer & Electronics Engineering - Omaha

**Category 4: Agriculture, agronomy, animal science, agriculture meteorology**

11. **Exploiting the Synergy between Ethanol and Distillers Grains**  
    Principal Investigator: Galen Erickson, Animal Science  
    Co-Investigator(s): Terry Klopfenstein, Animal Science

12. **Coupling Field Demonstrations and Simulation Model to Increase Energy and Crop Water Use Efficiency for Corn Production**  
    Principal Investigator: Suat Irmak, Biological Systems Engineering
13. **Dried Distillers Grains as a Source of Supplemental Energy and Protein for Developing Replacement Heifers**

Principal Investigator: Rick N. Funston, West Central Research and Extension Center  
Co-Investigator(s): Andrea S. Cupp, Animal Science, Rick J. Rasby, Animal Science

**Abstract**

Category 5: Economics, policy feasibility studies

14. **An Economic Analysis of Enterprise Options for the Bio-based Economy Initiative in Central and North Central Nebraska**

Principal Investigator: Alan E. Baquet, Agricultural Economics

**Abstract**
NCESR Research Grant Program

2007/08 Energy Research Grants

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**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 second competitive rounds of Energy Research Grants on July 16, 2007. Thirty-two UNL faculty teams submitted proposals totaling more than $1.62 million in requested funding.

**Cycle 2 – Selections.** The External Advisory Committee (EAC) met on October 9, 2007 and made funding selections in the Cycle 2 of Energy Research Grants offered to faculty at UNL. A total of $234,233 was awarded for the following new energy research projects:

- **Viability of Wind Generation for Farm & Rural Communities**
  Principal Investigator: Jerry Hudgins, Electrical Engineering
  Co-Investigator(s): Terrence Sebora, Center for Entrepreneurship, Ronald Yoder, Biological Systems Engineering
  
  [Abstract](#)

- **Enzymes for Enhancing Ethanol Production from Lignocellulose**
  Principal Investigator: James Van Etten, Plant Pathology
  Co-Investigator(s): Vicki Schlegel, Food Science and Technology, Kenneth Nickerson, Biological Sciences
  
  [Abstract](#)

- **Improved Controls for Biomass Heating and Impact on Greenhouse Profitability**
  Principal Investigator: George Meyer, Biological Systems Engineering
  Co-Investigator(s): John Hay, Assistant Extension Educator
  
  [Abstract](#)

- **Passive Solar Powered Earth Contact Heat Exchangers for Cooling Buildings**
  Principal Investigator: Bing Chen, Computer Science & Engineering
  Co-Investigator(s): Gang Wang, Architectural Engineering Mingsheng Liu, Architectural Engineering
  
  [Abstract](#)

- **Barriers to Adoption of Energy-Efficient Practices and Technology by Small Businesses**
  Principal Investigator: Shirley Niemeyer, Housing & Environment Research/Extension
  Co-Investigator(s): Jerry Deichert, Center for Public Affairs Research, UNO
  
  [Abstract](#)