

Energy Research Grants
Cycle 20 - REQUEST FOR PROPOSAL

Issue Date of RFP March 17, 2025
Preproposal Due May 15, 2025 – 5:00 p.m. CDT
Full Proposal By Invitation Only

- A. DESCRIPTION.** 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 to enhance UNL 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.
- B. GOAL.** The overall goal of NCESR is to foster research and education in energy sciences by providing funding to support innovative research and collaboration among UNL faculty and with other public- and private-sector organizations and businesses. More information about the Energy Center and previously funded energy research grants can be found at [NCESR Research Grant Awards](#).
- C. RESEARCH – CYCLE 20 FOCUS AREAS.** NCESR invites applications for funding of research projects that advance Nebraska’s energy landscape. Projects may address fundamental questions or development of solutions to specific challenges. Projects may utilize experimentation, modeling or simulation. The expected outcomes include aggressively pursuing external funding. The development of a start-up organization/business and development of intellectual property are highly encouraged. This year’s priorities include the following:
- **Electric Utility Priorities:**
 - Integration of renewables with fossil fuels
 - Electric system reliability and resiliency – modeling tools
 - Energy storage with potential for use at utility scale
 - Advanced renewable energy technologies including next-generation solar and utility scale geothermal
 - Energy generation using hydrogen, nuclear, ammonia and biofuels
 - Basic science to support nuclear fusion development
 - Hydrogen production including geologic extraction as a clean and cost-effective fuel source
 - Use of ammonium sulfate in agriculture and other productive uses
 - Artificial Intelligence (AI)-driven predictive analytics to optimize energy production, transmission, distribution, and consumption
 - Small Modular Reactors (SMRs): compact, scalable nuclear reactors with enhanced safety features
 - Zero carbon electricity generation
 - **Energy Efficiency:**
 - Prevention of corrosion of center pivot irrigation system components
 - Improve electrical efficiency of data centers and bitcoin mining technologies
 - Energy efficiency in buildings
 - Electric vehicles – energy issues related to efficiency, charging, batteries, and others

- **Energy use in transportation and electricity generation:**
 - Ethanol as a component of sustainable aviation fuel (SAF) or for electricity generation
 - Electric powered off-road vehicles for agriculture, commercial and recreational use
 - Hydrogen based vehicles including agricultural equipment
 - Hydrogen detection equipment and related instruments
- **Carbon:**
 - CO₂ capture and sequestration and other productive uses of carbon/carbon dioxide
 - Decarbonization processes for heavy industries
 - Carbon measurement instrumentation and tools to ensure compliance with applicable standards
 - Biochar production and utilization
 - Prevention of methane release to the atmosphere
 - Prevention of N₂O release to the atmosphere
 - Circular energy systems – recycling waste materials into energy-generating systems
- **Nebraska's Bioeconomy:**
 - New approaches to utilize Nebraska's agricultural and natural resources to advance the local bioeconomy (for example: sustainable aviation fuel, and other energy related materials applications)
 - Efficient use of water, energy and other critical feedstocks for production agriculture
 - Agrivoltaics (farming amongst solar farms)
 - Cellulosic biomass for aviation fuel
 - New usage and approaches to utilize Nebraska based corn stover for generation or industrial setting
 - Ethanol based electricity generation and/or hydrogen production
- **Energy Literacy:**
 - Engages the public to increase knowledge of timely energy topics including energy sources, generation, storage, transmission and current limitations of technologies
 - Nuclear SMR and clean biofuels and carbon capture

Contact the NCESR Director to discuss consideration of any idea(s) that can enhance energy efficiency and/or contribute to the development of cost effective, sustainable forms of energy that may not be included in the above list.

D. RESEARCH TEAM.

1. The research team includes the Principal Investigator (PI), and at least one Co-Investigator, but may be up to two Co-Investigator(s) and other internal and/or external members as appropriate to successfully perform the proposed work.
2. The PI must be a current UNL faculty member holding a tenured, tenure-track (e.g., Assistant, Associate, or Professor), or nontenure-track faculty appointment (e.g., Research Assistant, Research Associate, or Research Professor).
3. The Co-Investigator(s) must be current UNL faculty. The Co-Investigator(s) must be willing and able to take on the role of the PI in the unforeseen event; the PI no longer can perform that

function. The Co-Investigators must hold a tenured, tenure-track, *or* nontenure-track faculty appointment.

4. UNL faculty may serve as the PI for only one (1) preproposal; however, any individual may serve as a Co-Investigator on multiple preproposals.
5. UNL faculty not designated as the PI and Co-Investigator(s) are to be identified as participants on the research team.
6. Researchers from other universities and/or external partners from the private sector may also be members of the research team but cannot receive any NCESR funding.

E. COLLABORATION AND INNOVATION. Preproposals from interdisciplinary teams will be given priority, especially those resulting in disruptive innovations and clean energy technology that impact Nebraska, the nation, and the world.

F. FUNDING. Funding to support energy sciences research is provided by the [NPPD](#) to UNL and administered by the [NCESR](#).

G. PROJECT PERIOD.

1. The intent is for the effective start date to be January 1, 2026.
2. The project period for Year 1 is intended to be January 1, 2026 – December 31, 2026.
3. The end date for awards with authorized Year 2 funding is intended to be December 31, 2027, which makes the two-year project period January 1, 2026 – December 31, 2027. **Note:** If selected, only the Year 1 project period will be initially authorized; the end date will be extended to include the second year if the provisional Year 2 funds are authorized.

H. BUDGET. The maximum budget request for the preproposal is as follows:

1. A project that identifies with any of the focus areas as described in section C. RESEARCH – CYCLE 20 FOCUS AREAS:
 - a. For a one-year (12 month) research project, the maximum budget is \$85,000.
 - b. For a two-year (24 month) research project, the maximum total budget is \$170,000: \$85,000 maximum for Year 1 and \$85,000 maximum for Year 2. However, Year 2 funding is provisional and contingent on the PI's demonstration of adequate project and financial performance as documented in the required progress report and the in-person presentation at the fall Progress Review Meeting in Year 1.
2. When estimating the total research budget requested for the preproposal, salary and benefits are not allowed for faculty holding tenured or tenure-track appointments. Nontenure-track faculty who serve as PI are allowed a maximum of one-month of salary and benefits (summer or academic).

I. EXPECTATION TO SEEK EXTERNAL FUNDING. It is important and must be understood that a) NCESR provides **major funding** for two-year research projects to UNL faculty through the collaboration with NPPD, and b) Those invited to submit full proposals and selected to receive funding are expected to **aggressively submit proposals** to secure major external funding to supplement the NCESR seed grant.

As of 5/23/2024, it is required that the Principal and Co-Principal Investigator(s) submit proposals for external funding related to your NCESR-funded project through NCESR as an affiliate center. The Office of Research and Innovation provided this link with the guidance on how to credit NCESR on your routing forms in NuRamp. The guidance pre-dates NuRamp though the process is the same

for NuRamp as it was in Nugrant.

<https://research.unl.edu/sp1/docs/VCRCenterRoutingprocedure.pdf>

J. SELECTION.

1. The final decision of which principal investigators will be invited to submit full proposals will be determined and provided by the Executive Council (EC) to the NCSR.
2. The decisions of the EC are final.

K. PROCESS. The process will involve two competitive stages: the preproposal and the full proposal. The full proposal is by invitation only.

L. PREPROPOSAL PREPARATION INSTRUCTIONS. Please read carefully.

*University of Nebraska applications for internal funding must be submitted via the Internal Competitions module in [NuRamp](#). Sign in to [NuRamp](#) using your institutional credentials. Click on IC Application. Then from the drop down, select **Nebraska Center for Energy Sciences Research (NCSR) – Cycle 20 Preproposal Submission**.*

1. Preproposals are due by the date and time designated on page 1 of this RFP. **Requests for extensions or exceptions will not be accepted.**
2. The preproposal document must:
 - a. Include the following information per requirements and in the order described – **as a single Word document file** and uploaded into the Nebraska Center for Energy Sciences Research (NCSR) – Cycle 20 Preproposal Submission in the Internal Competitions module in NuRamp, which is explained in the above first paragraph of the Preproposal Preparation Instructions section. **Any other type of file, such as a PDF, will not be accepted; thus, VOIDING the preproposal.**
 - b. **Not exceed five (5) pages** when printed using standard 8.5” by 11” paper with a minimum of one (1) inch margins (top, bottom, left and right) and font no smaller than 11 point.
 - c. **Include the order and requirements as follows:**
 - c1. Title/abstract – page 1.
 - The title/abstract page must not exceed one page.
 - The title/abstract page must provide:
 - The project title (15 word maximum).
 - State the Focus Area(s) from section C. RESEARCH – CYCLE 20 FOCUS AREAS that your research applies to.
 - The PI name, position title (e.g., Professor, Associate Professor, Research Assistant, Research Associate etc.), department name and contact information; and the Co-PI name, position title (e.g., Professor, Associate Professor, Research Assistant, Research Associate etc.), department name and contact information for a minimum of one Co-PI or a maximum of two Co-PIs.
 - Name, title, the affiliation of other members of the research team.
 - **Keywords.** Enter up to five keywords that best describe the proposed research.
 - A brief abstract (300 word maximum).
 - c2. Narrative – pages 2 and 3.
 - The narrative must not exceed two pages. References are to be included.
 - An omission of any of these sections voids the preproposal.
 - The narrative **MUST** include the following sections:

1. A short, nonproprietary description of the project that can be understood by a nonscientific audience.
 2. The research goal and scientific objective(s) of the project including methods to be employed.
 3. The energy science merit and potential impact of the project (i.e., energy science innovation, benefits, outcomes).
 4. Sources where the principal investigator will apply for future funding.
 5. The proposed project length (one year/12 months or two years/24 months).
 6. The total budget request.
- c3. Curriculum Vitae – pages 4 and 5.
- The Curriculum Vitae must not exceed two pages.
 - The Curriculum Vitae must be for the Principal Investigator only and must include pending, current and past external funding from 2020-present.
3. **A preproposal that does not follow all of the requirements will not be reviewed.**
4. **Once you have clicked “Submit” you are finished with the submission process for your application. Please disregard the statement about “The next step is Review Management.”**
5. You will receive an e-mail notification by the next business day confirming your application has been submitted.

M. FULL PROPOSAL – By Invitation Only

Only the Principal Investigators who are invited to submit a full proposal in the second stage of the competitive process will be provided more specific information regarding the due date, requirements and instructions to electronically submit the full proposal.

N. PUBLICATION ACKNOWLEDGEMENT.

Please use the following acknowledgement format when referencing the Energy Center on your publications. “This work was supported by the Nebraska Public Power District through the Nebraska Center for Energy Sciences Research at the University of Nebraska-Lincoln.”

O. NCESR CONTACT.

For questions or more information, contact the Nebraska Center for Energy Sciences Research:

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