Environment and Natural Resources Trust Fund

2023 Request for Proposal

General Information

Proposal ID: 2023-126

Proposal Title: Establishing the Center for Renewable Energy Storage Technology

Project Manager Information

Name: Bryan Herrmann

Organization: U of MN - Morris

Office Telephone: (320) 589-6038

Email: herrmanb@morris.umn.edu

Project Basic Information

Project Summary: The focus of this project is to establish the University of Minnesota Center for Renewable Energy Storage Technology in Morris, Minnesota (CREST) and to hire its first coordinator and interns.

Funds Requested: $472,000

Proposed Project Completion: July 31, 2026

LCCMR Funding Category: Air Quality, Climate Change, and Renewable Energy (E)

Project Location

What is the best scale for describing where your work will take place?

Statewide

What is the best scale to describe the area impacted by your work?

Statewide

When will the work impact occur?

During the Project and In the Future

Narrative

Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.

To help advance energy storage solutions in Minnesota our team will establish a new initiative, the Center for Renewable Energy Storage Technology (CREST). To achieve an energy-resilient Minnesota, energy storage projects need to be developed and implemented. The results of those projects need to be broadly communicated for wider adoption by the energy marketplace and businesses. University of Minnesota Morris (UMN Morris) and University of Minnesota West Central Research and Outreach Center (WCROC) have a history of clean energy research, development, demonstrations, and success. There are several interconnected challenges we seek to address with energy storage. First, we need an energy-resilient grid that stores energy (via batteries, hydrogen, or ammonia) and can integrate clean energy into the grid when it is not sunny or windy. Second, we need clean energy technologies that help conserve water resources. Traditional energy production demands a significant amount of water to run effectively. Third, communities need information and projects to implement storage solutions on the ground, including on the farm, in homes, in water treatment plants, in wastewater plants and in rural and urban cities. CREST will help address these challenges of intermittency, water conservation and protection, and disparate land-uses.

What is your proposed solution to the problem or opportunity discussed above? Introduce us to the work you are seeking funding to do. You will be asked to expand on this proposed solution in Activities & Milestones.

To address the challenges identified above, we see a window of opportunity to launch CREST and establish a new center within the University of Minnesota that would serve the state of Minnesota. The work of CREST would focus on several main areas. One) Establish CREST: Develop a communication platform, including a website. Two) Launch the CREST Conference and Communication Series. Develop both in-person and online events to highlight and communicate energy storage developments in Minnesota, the Upper Midwest, and around the world. Developments in storage are moving quickly, and it requires constant attention to help energy storage participants stay current. Three) Launch the CREST Community Support Initiative: Support, connect and communicate with other energy storage pilot project sites within Minnesota. There needs to be a connector and convener. Fourth) Launch the CREST Energy Storage Destination Program: Provide services to visitors, organizations, and school groups who visit Morris. We need to provide access to groups who want to learn more about energy storage. Providing tours requires time and resources, including curriculum for youth. This is a critical piece. People need to “kick the tires" in Minnesota, not some other state.

What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state’s natural resources?

Minnesota has abundant natural resources, including wind and solar. As a state, Minnesota has a lot of progress to make in integrating energy storage solutions into our energy grids. By integrating energy storage, we reduce pressure on our water resources -- protecting and conserving those water resources for other needs. Energy storage solutions also provide opportunities for creative land use and conservation in our communities. Energy storage is an economic development opportunity.

Activities and Milestones

Activity 1: Establish the Center for Renewable Energy Storage Technology

Activity Budget: $188,800

Activity Description:
This activity is focused on establishing CREST as a new Center in our state, under the auspices of the University of Minnesota. We will convene faculty and staff within the UMN system who have or may be interested in partnering with the Center. We will develop a communication platform, including a website. We will connect with partners across Minnesota and globally who are similarly invested in energy storage efforts, especially around battery storage technologies and emerging hydrogen- and ammonia-storage technologies.

Activity Milestones:

Description	Completion Date
Hire CREST Coordinator	October 31, 2023
Convene energy-storage active UMN faculty and staff	December 31, 2023
Develop communication platform/website	December 31, 2023
Launch CREST website	May 31, 2024
Establish connections with external partners	July 31, 2024
Develop network mapping of partners	July 31, 2025

Activity 2: Launch the CREST Conference and Communication Series

Activity Budget: $94,400

Activity Description:
This activity is focused on launching the CREST Conference and Communication Series – and on developing connections with organizations and individuals across Minnesota. We will organize both in-person and on-line events to highlight and communicate energy storage developments in Minnesota, the Upper Midwest, and around the world. Developments in storage are moving quickly, and they require constant attention to help energy storage participants stay current. The CREST Conference and Communication Series will provide stakeholders an opportunity to learn more about current activity in energy storage, including alternative battery technologies and developments in hydrogen and ammonia as energy storage carriers. There is not currently an organization that is specifically focused on bringing these threads together. Our energy storage future will need to bring together short-term and mid- to long-term energy storage options to explore how these solutions can be applied to different aspects of community life, for example, what can work on the farm, a water treatment plant, a Minnesota military base, or a school.

Activity Milestones:

Description	Completion Date
Launch 1st CREST Conference	July 31, 2024
Launch CREST Communication Series	July 31, 2025
2nd CREST Conference	July 31, 2025
3rd CREST Conference	July 31, 2026

Activity 3: Launch the CREST Community Support Initiative

Activity Budget: $94,400

Activity Description:
This activity is focused on supporting, connecting, and communicating with other energy storage pilots and project sites

within Minnesota. For example, there are current energy storage projects in Morris, Red Lake, and North Minneapolis. Some utilities are exploring storage projects and have many questions about their technical options. There are also some higher education institutions that are beginning to explore storage options. This objective includes bringing together communities which are interested in energy storage projects so they may learn from each other and create digital assets that can be shared (e.g. recorded video, recorded webinar, podcasts, etc.). This activity helps us advance our equity, diversity, inclusion and justice goals for this larger project.

Activity Milestones:

Description	Completion Date
Connect Energy Storage Pilot Communities	July 31, 2024
Produce and release digital assets from community sites	July 31, 2025
Networking events with community sites	July 31, 2026

Activity 4: Launch the CREST Energy Storage Destination Program

Activity Budget: $94,400

Activity Description:
We will provide access to groups as a clean energy destination education program within Minnesota for those who want to learn more about locally developed emerging energy storage technologies. This outreach educational programming is critical to the success of broadly distributing these emerging technologies. Educators, students, municipalities, and businesses can “kick the tires” on locally applicable clean energy technologies. Research supports the concept that solar and storage systems are complementary, and as municipalities, schools, and businesses explore options, they won’t have to travel out of state to learn more – Morris will be their first destination.

Activity Milestones:

Description	Completion Date
Develop Morris Energy Storage Tour materials for general public	July 31, 2024
Develop Morris Energy Tour materials for school visits	July 31, 2025
Provide Energy Storage Tours	July 31, 2026

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Troy Goodnough	University of Minnesota Morris	Goodnough holds the position of sustainability director at the University of Minnesota Morris. Goodnough will serve on the CREST Leadership Team and will collaborate with and support the activities of the CREST coordinator.	No
Eric Buchanan	University of Minnesota West Central Research and Outreach Center	Buchanan holds the position of solar scientist at UMN WCROC. Buchanan will serve on the CREST Partnership Team and will collaborate with and support the activities of the CREST coordinator.	No
Blaine Hill	City of Morris	Hill is a lead member of the Morris Model and as City Manager will partner for potential demonstration sites in the City for critical infrastructure. The City of Morris has been a partner in expanding renewable energy to city owned buildings.	No

Long-Term Implementation and Funding

Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this work be funded?

The main goal of this project is to establish the new Center for Renewable Energy Storage Technology. This includes hiring its first coordinator, and establishing a set of programs and partnerships. Our team believes that establishing this Center and demonstrating an initial period of success opens the door to additional funding from several sources, including private funding, federal funding and University funding.

Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Storing Renewable Energy In Flow-Battery For Grid Use	M.L. 2021, First Special Session, Chp. 6, Art. 5, Sec. 2, Subd. 07a	$250,000
Storing Renewable Energy In Flow-Battery For Grid Use	M.L. 2021, First Special Session, Chp. 6, Art. 6, Sec. 2, Subd. 07b	$2,408,000

Project Manager and Organization Qualifications

Project Manager Name: Bryan Herrmann

Job Title: Vice Chancellor of Finance and Facilities

Provide description of the project manager's qualifications to manage the proposed project.

Herrmann has a 20 year record of service at the University of Minnesota Morris, currently in the role of Vice Chancellor for Finance and Facilities. Expanding on the foundation of the previous leadership, Herrmann, along with a visionary team, has expanded solar pv production, academic initiatives, and energy efficiency projects, driving the campus to achieve carbon neutrality in electricity. Herrmann serves as a key member of the Morris Model team that works across community, university, and international entities to reach strategic goals within the Morris community that include generation of renewable energy, reduction of energy consumption, and elimination of landfilling of waste. He has also worked to reduce the carbon footprint of his own household through a solar installation and electric vehicle ownership. Herrmann holds a B.A. in economics and management from the University of Minnesota, Morris and a M.B.A. from the University of Minnesota, Duluth.

Organization: U of MN - Morris

Organization Description:
UMN Morris is the public liberal arts campus of the University of Minnesota located in west-central MN, serving 1700 students. The campus recently was recognized by the Department of Education as one of nine first-ever ED Green Ribbon Schools Postsecondary Sustainability Awardees and by the Environmental Protection Agency for its demonstration-model of renewable energy production—nearly 70 percent of its electrical needs are met by onsite renewable energy sources. The collaboration with the Morris Model and the Climate Smart Municipalities program creates opportunities to learn about the future of energy through the climate protection agreement with Saerbeck, Germany.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	$ Amount
Personnel								
CREST Coordinator		Staff person responsible for coordinating the work of the Center for Renewable Energy Storage Technology (CREST)			33.5%	3		$328,270
Student Interns		Undergraduate student interns to support the work of the Center. This is a great opportunity for students to grow their skills, along with supporting the efforts of CREST.			0%	2.61		$121,500
							Sub Total	**$449,770**
Contracts and Services								
							Sub Total	**-**
Equipment, Tools, and Supplies								
							Sub Total	**-**
Capital Expenditures								
							Sub Total	**-**
Acquisitions and Stewardship								
							Sub Total	**-**
Travel In Minnesota								
	Miles/ Meals/ Lodging	Mileage, lodging, Meals for 4 overnight trips per year, 8 day trips with only mileage and meals.	Coordinator to travel to sites in Minnesota and present at events or conferences.					$14,650
							Sub Total	**$14,650**

Travel Outside Minnesota								
							Sub Total	**-**
Printing and Publication								
	Printing	Educational diagrams, posters, and reports	Communicate about the center and the current projects and information.					$7,580
							Sub Total	**$7,580**
Other Expenses								
							Sub Total	**-**
							Grand Total	**$472,000**

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request

Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
			State Sub Total	**-**
Non-State				
In-Kind	University of Minnesota In Kind	Support the work of the coordinator and interns through CREST Leadership and participant teams. The source is U of M unrecovered F & A related to the project.	Secured	$165,199
			Non State Sub Total	**$165,199**
			Funds Total	**$165,199**

Attachments

Required Attachments

Visual Component

File: 0c3d7b17-a1d.pdf

Alternate Text for Visual Component

Collection of images showing Wind to Hydrogen/Ammonia Production, Solar Array for cattle grazing, energy storage example for UMN Morris and larger grid and a photo of the wind turbines overlooking the scenic Pomme de Terre River....

Administrative Use

Does your project include restoration or acquisition of land rights?

No

Does your project have potential for royalties, copyrights, patents, or sale of products and assets?

No

Do you understand and acknowledge IP and revenue-return and sharing requirements in 116P.10?

N/A

Do you wish to request reinvestment of any revenues into your project instead of returning revenue to the ENRTF?

N/A

Does your project include original, hypothesis-driven research?

No

Does the organization have a fiscal agent for this project?

Yes, Sponsored Projects Administration

2023 Environment and Natural Resources Trust Fund (ENRTF) Proposal
Project Title: Establishing the Center for Renewable Energy Storage Technology

Wind to Hydrogen/Ammonia Production Project at West Central Research and Outreach Center

Morris is an ideal place to learn about Energy Storage from the varied energy production systems in place or soon to be in place

Solar Array at UMN Morris elevated to allow cattle to graze

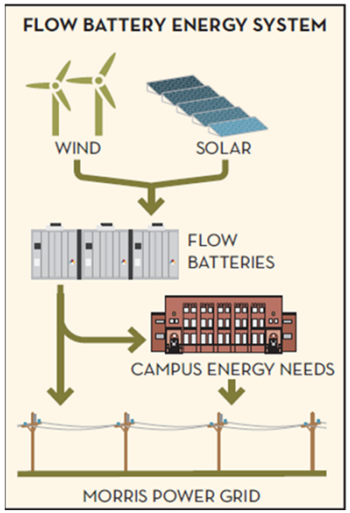

Diagram of energy system integration for UMN Morris campus and larger grid