



Environment and Natural Resources Trust Fund

2024 Request for Proposal

General Information

Proposal ID: 2024-187

Proposal Title: Build Out - Center for Renewable Energy Technology

Project Manager Information

Name: Troy Goodnough

Organization: U of MN - Morris

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Project Basic Information

Project Summary: The focus of this project is to build out the University of Minnesota Center for Renewable Energy Storage Technology (CREST) in Morris, Minnesota .

Funds Requested: \$200,000

Proposed Project Completion: June 30, 2026

LCCMR Funding Category: Small Projects (H)

Secondary 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 build out our new initiative, the Center for Renewable Energy Storage Technology (CREST) as we enter the post-implementation phase of the project. To achieve an energy-resilient Minnesota, energy storage projects need to be developed and implemented and the results of those projects need to be broadly communicated for wider adoption by the energy marketplace, communities and businesses. UMN Morris and WCROC have a history of clean energy research, development, demonstrations, and success that goes back 20 years. 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 will leverage CREST to help the state of Minnesota ensure 55% of our electricity comes from renewable sources by 2035 and 100% of our electricity is carbon-free by 2040. The work of CREST can help by focusing on several main areas. One) As our energy storage solution comes online, it's essential that we monitor its performance to ensure it's working to expectation. Two) When groundbreaking projects like CREST proceed toward implementation, there are invariably stumbling blocks and lessons learned. If Minnesota's goal is for communities around the state – particularly rural ones - to undertake work like the CREST project, we must transparently communicate about the challenges these projects face how to overcome those challenges. Three) Delivering on two value-adding, community facing efforts, the CREST Community Support Initiative (CREST connects with and delivers knowledge to energy storage pilot project sites within Minnesota) and the CREST Energy Storage Destination Program (CREST provides tours and other services to visitors, organizations, school groups and others who visit Morris to learn more about energy storage. we want people to “kick the tires” and “see the future” of energy storage projects 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 if we are to meet the aggressive renewable and carbon-free energy targets established this year. By integrating energy storage, we reduce pressure on our water resources - protecting and conserving water resources for other needs. Energy storage solutions provide opportunities for creative land use and conservation in our communities These opportunities and others can lead to the kind of economic development that communities across the state are struggling to achieve.

Activities and Milestones

Activity 1: Design, Develop and Implement CREST Storage Monitoring

Activity Budget: \$80,000

Activity Description:

After establishing CREST as a new Center in our state, under the auspices of the University of Minnesota, it will be important to source and secure performance monitoring technology and recruit and hire interns who can review and interpret the readings in real time. This would include interns from UMN Morris as well as interns from high schools in the region.

Activity Milestones:

Description	Approximate Completion Date
Requirements gathering	December 31, 2024
Design CREST Storage Monitoring plan	December 31, 2024
Develop CREST Storage Monitoring plan	May 31, 2025
Implement CREST Storage Monitoring plan	July 31, 2025
Evaluate CREST Storage Monitoring plan	December 31, 2025

Activity 2: Capture CREST Project Implementation Process and Performance Monitoring Data

Activity Budget: \$40,000

Activity Description:

This activity is focused on capturing the implementation process and the performance data from the CREST project. By capturing this data – including the parts of the process that have been particularly challenging and the real-time performance of the energy storage solution – we ensure that we have the kind of information that external audiences will find useful. When communities face high-stakes decisions – like deciding whether to install solar or wind energy or whether to install an energy storage solution – they want complete and transparent information. They want to know what went wrong, what went right and what it all means. By capturing the process we went through to secure, install and bring online our energy storage solution and then capturing its performance, we will be able to tell the type of story that is not only interesting but extremely valuable as communities make “go or no go” decisions on renewable energy.

Activity Milestones:

Description	Approximate Completion Date
Gather implementation and milestone data	July 31, 2025
Identify and break out lessons learned and best practices	November 30, 2025
Compose initial implementation draft	March 31, 2026
Compose initial storage monitoring draft	March 31, 2026
Review reports	May 31, 2026
Publish final reports	June 30, 2026

Activity 3: Launch the CREST Community Support Initiative

Activity Budget: \$40,000

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	Approximate Completion Date
Connect Energy Storage Pilot Communities	July 31, 2025
Capture digital assets	July 31, 2025
Produce and release digital assets from community sites	March 31, 2026
Networking events with community sites	June 30, 2026

Activity 4: Launch the CREST Energy Storage Destination Program

Activity Budget: \$40,000

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	Approximate Completion Date
Develop Morris Energy Storage Tour materials for general public	July 31, 2025
Develop Morris Energy Storage Tour materials for school visits	July 31, 2025
Provide Energy Storage Tours	June 30, 2026

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Bryan Herrmann	University of Minnesota Morris	Herrmann has been vice chancellor for finance and facilities since July 2015. A diverse renewable energy platform is a key part of the campus community's plan to achieve carbon neutrality under Herrmann's leadership.	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 build out and strengthen the new Center for Renewable Energy Storage Technology. This includes hiring its first interns and establishing a set of programs and partnerships that will extend the utility of CREST well beyond UMN Morris, the City of Morris, and Stevens County. Our team believes that strengthening the Center and demonstrating 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: Troy Goodnough

Job Title: Director, Office of Sustainability

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

Troy was the first sustainability coordinator hired in the University of Minnesota-system in 2006. Troy works with students, faculty and staff to develop and implement sustainability initiatives. His work has included creating new educational programs, outreach initiatives, and renewable energy projects. Troy provides leadership with the Upper Midwest Association for Campus Sustainability, the West Central Clean Energy Resource Teams Steering Committee, and other sustainability-focused groups. During his tenure as director, Morris has earned three AASHE STARS Gold ratings, the Second Nature Climate Leadership Award, the Minnesota Climate Adaptation Award, the National Association of College and University Business Officers Institutional Award, Minnesota Green Ribbon Schools Award, and recognition by Sierra Club, Princeton Review, the New York Times, Minnesota Environmental Initiative and other organizations.

Previous to his university service, Troy spent a decade in semiconductor start-up companies across the United States leading crystal growth operations for laser development. His educational background is in chemical engineering and chemistry.

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)			36.8%	1		\$103,230
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%	0.86		\$81,000
							Sub Total	\$184,230
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.					\$9,760
							Sub Total	\$9,760

Travel Outside Minnesota								
							Sub Total	-
Printing and Publication								
	Printing	Educational diagrams, posters, and reports	Communicate about the center and the current projects and information.					\$6,010
							Sub Total	\$6,010
Other Expenses								
							Sub Total	-
							Grand Total	\$200,000

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
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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	\$70,000
			Non State Sub Total	\$70,000
			Funds Total	\$70,000

Attachments

Required Attachments

Visual Component

File: [b3db947c-4ba.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....

Optional Attachments

Support Letter, Photos, Media, Other

Title	File
2022 University of Minnesota Annual Financial Report	d5ecdf20-7c3.pdf
University of Minnesota Tax Status Letter	4b777d18-468.pdf
University of Minnesota Board of Regents Letter	29648021-699.pdf

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

Does your project include the design, construction, or renovation of a building, trail, campground, or other capital asset costing \$10,000 or more?

No

Do you propose using an appropriation from the Environment and Natural Resources Trust Fund to conduct a project that provides children's services, as defined in Minnesota Statutes section 299C.61 Subd.7?

No

